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DESCRIPTIVE AND EXPLANATORY

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PSYCHOLOGY

DESCRIPTIVE AND EXPLANATORY

A TREATISE OF THE PHENOMENA, LAWS, AND DEVELOPMENT OF HUMAN MENTAL LIFE

BY

GEORGE TRUMBULL LADD

PROFESSOR OF PHILOSOPHY IN YALE UNIVERSITY

FIFTH EDITION

NEW YORK

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1909

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To

MY PUPILS

FROM WHOSE QUERIES AND OBSERVATIONS

BOTH NAÏVE AND WELL CONSIDERED

I HAVE DERIVED MORE INSIGHT INTO THE NATURE OF THE HUMAN MIND

THAN FROM READING MANY BOOKS

THIS VOLUME

IS RESPECTFULLY AND AFFECTIONATELY DEDICATED

"Greift nur hinein in's volle Menschenleben! Ein Jeder lebt's
Nicht Vielen ist's bekannt, und wo ihr's packt, da ist's interessant."
—Goethe

PREFACE

NOTWITHSTANDING the fact that several brilliant, learned, and voluminous works on the science of Psychology have recently appeared in English, there is not only room, but also a real demand, for still other attempts at improved treatment of the same subject. For this science has, during some time past, worthily rivalled and even excelled most other forms of scientific inquiry, both as respects the quality and number of its devoted workmen, and also as respects the rapidity of its advances and the number and startling character of its discoveries. There are special reasons, moreover, why the field of inquiry into the phenomena of human mental life can never be closed to newcomers, for a hearing of their claims to improved results as compared with their predecessors, even for a brief space of time. In psychology the individual point of view and the particular method of investigation and of treatment chosen, as well as the mental characteristics of the investigator, determine the character of the results as in no other one of the sciences.

What has just been said should not, however, be understood as a timid apology for appearing at the present moment with another *new* treatise covering a field of investigation and publication so recently wrought over. The book which is here given to the public presents the results, in much condensed form, of many years of observation, reading, and experiment. The few foot-notes and confessedly meagre bibliography at the end of the chapters afford no adequate recognition of the help received from the hundreds, not only of larger works, but also and chiefly of magazine articles and of minor monographs, which have been consulted in its preparation. Every expert student of psychology knows that in this latter form of literature (most of which is inaccessible to the general reader, and much of which is not to be found even in our largest libraries) the most valuable ma-

terial for his science is to be found. For my right to use with both confidence and discretion the material derived from modern physiological and experimental psychology, my works previously published ("Elements of Physiological Psychology" and "Outlines of Physiological Psychology") may be left to testify. On this point I will only add that the present book contains no little that is new of this sort, drawn both from my private notes and from experimental sources not accessible in published form. As the dedication aims to show, it has been my chief ambition and my constant practice to bring my "science" of mental phenomena to the testing of actual and concrete human life. This has been, indeed, a daily and almost hourly pleasure rather than a task; so that for many of the following conclusions I must appeal, not only to introspective and reflective self-consciousness, and to the mental processes of pupils and colleagues, but also to the mental life of the common people and to the profounder voices of art and of literature. The cry which must be ever ringing in the ears of the genuine psychologist is this: "Back, from books and laboratories, to actual and concrete human life."

Briefly characterized, then, this book designs to give a clear, accurate, and comprehensive picture of the mental life of the individual man; and also to explain this life as it appears in the light of *all* the resources of modern psychological science, and with the idea of "*development*," as essentially characteristic of this, as it is of all life, constantly kept in mind.

While gratefully acknowledging my indebtedness to each of the large band of predecessors in this our common work—as well to those I have named as to the many more unnamed—I can truthfully acknowledge no special obligations to any individuals among this number. It will not require a wide acquaintance with psychological literature for the reader to discover that the points of view, the order of treatment, the discussion of the particular topics, are all independent and thoroughly the author's own. Indeed, it is my belief that there is not a page, and scarcely a line, of this treatise which does not show that all its material has been wrought anew into a distinct and characteristic organism of truth. Attention is particularly called, however, to the divisions of the book, which abandon even the appearance of re-

taining the old and vicious theory of faculties; to the consistent tenure of the view that the formation and development of faculty is itself the chief thing which scientific psychology has to explain; to the treatment, in particular, of the affective phenomena —the nature, classes, and tone as pleasure-pain, of the feelings, and the growth of the emotions and sentiments; to the theory of perception and of the nature and growth of knowledge which is advocated; to the discussions where psychology comes into critical contact with logic; and, above all, to the view taken of the moral sentiments and of the nature and evolution of will.

I wish to add a single word to those teachers of psychology who may do me the honor to make use of my book for the instruction of their classes. The presentation here made is obviously not designed merely for use as a text-book. At the same time it is the product of one who has taught a large number of pupils, and it embodies much experience gained from the work of the class-room. I only express the assured results of this experience when I say that, for persons who have reached the maturity which most students have attained when they begin psychology, "primers," which talk down to them and have everything put into exact verbal form for them conveniently to commit to memory, are by no means the best and most improving text-books. I am inclined to think that, if it had been my intention to adapt this treatise solely to class-room use, I should not greatly have changed it, either as respects amount and kind of material or the style of its presentation. Only it must not be forgotten that, in no other science as in psychology, is it so necessary for the teacher really to *teach*, and not merely to give out tasks and to hear recitations.

In this connection I gratefully acknowledge the valuable assistance of my colleague, Professor George M. Duncan, who has read the entire volume and has made several helpful suggestions, chiefly looking toward increased clearness and consistency of statement; and, therefore, of course, its better adaptation to the teacher's uses.

In many places in this book I have brought the subject up to the borders—so subtile and almost indistinguishable—where psychology touches the broader, all-embracing domain of phi-

losophy. But I believe I have succeeded (although I have nowhere decried "metaphysics in psychology," or advocated "psychology without a soul"), not only in promising to reserve the philosophical problems for another volume, but in actually keeping my promise.

GEORGE TRUMBULL LADD.

YALE UNIVERSITY,
NEW HAVEN, CONN., 1894.

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PSYCHOLOGY: DESCRIPTIVE AND EXPLANATORY

INTRODUCTORY

CHAPTER I.

DEFINITION AND PROBLEM OF PSYCHOLOGY

THE difficulties of defining the science which it is now customary to call "psychology" are, in part, common to all branches of scientific inquiry. In general, satisfactory definition is one of the latest results of the growth of any science; and since every genuine science is in a constant process of growth, the conception to which its name answers is subject to change in the thought both of the individual student and of the race. The more complete and accurate conception which the definition is designed to embody must be established and defended in the course of the detailed investigations. With the understanding, then, that the statement is only provisional, we define psychology as *the science which describes and explains the phenomena of consciousness, as such.*

This definition, like every other, involves certain assumptions both of fact and of principle; it also involves certain subordinate conceptions, some of which require further definition, and some of which, perhaps, cannot be defined. The task of justifying the assumptions, of defining the subordinate terms, and of tracing the vaguer aspects of thought to their ultimate factors, must also be left to the development of the science itself. A few words here, however—even if they must be of a somewhat controversial character—will be helpful, and are indeed necessary. Our definition assumes not only that such a science as psychology is remotely possible, but even that it actually exists. It also assumes that a class of phenomena, called "phenomena of consciousness" (or by other equivalent terms), may be distinguished from other classes of phenomena

however closely related, and may be made the data of scientific inquiry. It assumes that these phenomena may be described and so classified; it also assumes that they may be—however partially—explained. That is to say, the conditions under which the phenomena occur, their connection, under law, with one another as psychic facts and with other non-psychic facts, may be known; the more complex may be analyzed into the more simple, and the principles of the combination of the simple into the complex may be discovered; the history of the evolution of these phenomena may be written. All these assumptions have been disputed. The definition, being preliminary, only settles such dispute for us until, in the course of the unfolding of the science, the disputed matters can be thoroughly discussed.

This definition of psychology also refers us, in our inquiry concerning the particular subjects of investigation, to the "phenomena of consciousness, as such." But what is "consciousness"? and how, without having this term carefully defined, shall we know what it is of which psychology specifically treats? Strictly speaking—as we shall soon see—the term "consciousness" cannot be defined; because the conception of consciousness cannot be analyzed. The impossibility of performing such analysis is connected with the most fundamental and ultimate nature of the phenomena of consciousness themselves. And yet every one may know sufficiently well for the purpose of psychological study, and, indeed, with a peculiar immediacy and certainty of knowledge, what is meant by a "phenomenon of consciousness, as such." Perceptions—whether full and clear or meagre and obscure, whether coming by the eye or by the hand, and whether of our own bodies or of the remotest star—*as perceptions*, or facts of mental life; thoughts—whether logical or illogical, whether of business or of philosophy, *as thoughts*, or facts of mental life; feelings—whether painful or pleasurable, and whatever about—*as feelings*, or facts of mental life; desires and volitions—whether weak or strong, vague and aimless or definite and purposeful—*as desires and volitions*, or facts of mental life;—such are the phenomena of consciousness.

§ 1. It has been denied that psychology is a science, and this not only by unfriendly critics, who dwell upon its long-continued stage of stagnation, but also by ardent students of psychology from its most modern points of view. Such denial arises either from ignorance concerning the achievements of the last fifty years of psychological research, or from a too narrow conception of science in general; or else it is framed under the influence of some theory as to what kind of science psychology in particular ought to become.

It is simple matter of fact that no other form of investigation has, during

the last half century, made greater and swifter advance than psychology; no other has accumulated a larger collection of available data or done more toward pointing out, both experimentally and speculatively, the regular connections between its observed facts. Moreover, we cannot approve of that use of the word "science" which, if consistently carried out, would exclude from this category not only human psychology, but also all the results of research into the principles of politics, economics, philology, into history, ethics, ethnology, and religion. Nor is the difference, as respects certainty, upon matters of fact and matters of so-called law, between those sciences which sometimes arrogate the exclusive use of this proud title and those which are thus arrogantly excluded from claim to the title, by any means so great as is often supposed.

Most unseemly of all positions is the refusal of the term "science" to psychology, because it has as yet discovered no law corresponding to the Newtonian principle of gravitation or to the principle of chemical equivalents. For who knows, or can rightly assume, that there is in reality any *such* law to be discovered; that the infinitely varied and concretely individualized facts of human mental life are ever really to be explained after the analogy of planets and atoms? To write voluminous treatises on psychology as a so-called natural science, and yet deny that there *is* a science of psychology because the phenomena cannot be reduced to an order like that of certain physical phenomena, is to undermine the results and value of one's work by a premature hypothesis.

The definition (and indeed the appearance of this treatise on psychology as well as that of every other similar treatise) assumes that psychology is a science. The assumption can be completely verified only in the course of the investigation itself.

§ 2. It has also been denied that we can define psychology, because we cannot clearly mark off its appropriate field. Thus Dr. Ward (art. Psychology, in Encyc. Brit., p. 37) holds that our inability to draw the distinction, at the outset, between internal experience and external experience—to distinguish "what takes place in the mind" from "what takes place without"—makes it impossible to define psychology as we do the sciences of matter. On the contrary, no distinction seems, "at the outset," to be more clearly and promptly made than this by the reflective mind of all mankind.[1] It is only after the professional student has introduced certain metaphysical discussions, which ought to be left to the later stages of psychology or to philosophy, that this seemingly obvious distinction becomes debatable and confused. *The facts of ordinary human consciousness, faithfully described, are the data to which scientific psychology must return again and again, and in behalf of the complete explanation of which it must summon all the resources of modern investigation.* The distinction between external facts and facts of consciousness, as actually made by every man, furnishes not only "at the outset," but all the way through, the one peculiar and abiding standpoint of psychology, as descriptive and explanatory science.

[1] As Natorp has well said: "In all strife (as between Monism and Dualism, etc.) this, at least, remains firmly established: that in consciousness the limits of the psychical and the physical allow of being definitely marked—at any rate, so far as the 'phenomenon' of things is concerned, however the case may stand as regards their ultimate essence." (Einleitung in d. Psychologie, p. 10.)

It might further be claimed, in agreement with M. Rabier,[1] that the real difficulty is not so much to find psychological objects for investigation as to find true physical and physiological objects. It would seem, accordingly, that there is danger lest all the other sciences should be submerged in the one universal science, psychology. But why trouble ourselves at present about the possibility of making a distinction so obvious? Facts of consciousness exist in abundance, as the data for psychological investigation; they are the facts which constitute your experience and mine. But psychology studies these phenomena *as such;* it investigates the facts *in themselves* and *for themselves.*

§ 3. Various terms have been proposed to express, in the most general way, those data whose description and explanation constitutes the science of psychology. The term "phenomena of consciousness" brings psychology into relation to the other sciences, all of which find their sphere as particular sciences in the description and explanation of some characteristic group of phenomena. The phenomena which furnish the data of psychology are characterized by the collective term "of consciousness." "Facts of consciousness," "facts of mental life," "mental or psychic facts" are kindred terms. The word "psychoses" has been proposed as a most general designation for all concrete psychic facts. The phrase "states of consciousness" suggests that relative stability and complexity, due to more or less of mental development, which the immediate data for our psychological investigation in general have. We may properly consult convenience in giving variety to our discussion by adopting any of these different but almost equally appropriate terms.

It is important to notice also that the definition assumes: not only facts of consciousness exist and, *as such*, may be made the data of scientific investigation; but, in becoming such data, facts of consciousness are made *objects of knowledge.* The phenomena of psychic life exist, and they may be *known* as facts. These states of consciousness, as they primarily awaken our interest and so form the basis of psychological investigation, are what we are accustomed to call our "knowledge"—whether of our own so-called inner experience or, inferentially, of the inner experience of others. From this conclusion several important results follow, the fuller meaning and effect of which can be seen only later on. Hence the impossibility of observing states of consciousness, after they are converted by deliberate and reflective attention into objects of knowledge, which shall accurately reproduce states of consciousness not thus fully converted into objects of knowledge. And to this fact, namely, that all states of consciousness, in order to become data for scientific investigation, must be converted, as it were, into objects of knowing consciousness—do we attribute in large measure what Professor James has referred to as "fallacies of the psychologist."

The definition of psychology as a "Science" also assumes that some kind of system actually exists among the occurrences which we call "phenomena of consciousness." The facts upon which, as data, our scientific investigation concentrates itself, have in

[1] Leçons de Philosophie, I. Psychologie, p. 98.

reality connections with one another of a regular sort; they have also common connections of the same sort—it may be—with other groups of facts that, in their turn, furnish data to other particular sciences. Otherwise psychic facts could not be studied with even the hope of reducing them to terms of science. For "facts" isolated and unconnected among themselves, cannot become data of *science*.

Now, in the universal estimate, whether popular or scientific, the character of the connection which exists among psychic facts is somewhat peculiar. At the outset of our investigation we wish to assume this connection in a manner as free as possible from all debatable metaphysical tenets. In some manner, however, we are obliged to assume it in order to study psychology at all. For this universal estimate assigns all psychic facts to some psychical individual, some so-called "Mind" or "Self." Indeed, the character of the consciousness from which this estimate springs is such that nothing seems more absurd, more inconceivable, than the assumption of psychic facts which belong to no one. The phenomena of human consciousness, in general, can be observed and studied only on the popular assumption that they always appear as phenomena *of* some so-called human being. From this undoubted truth follow several important conclusions. Psychic facts inevitably break up, as it were, into as many groups as there are individual psychical beings. All phenomena of consciousness are facts, either of your mental life, or of mine, or of some other so-called "person," in the popular sense of this word.

Moreover, the connection existing among the facts within each one of these subordinate groups is distinctly peculiar—is, indeed, unique. This connection may—nay, must—be thought of in two directions. The phenomena of *my* consciousness belong to *me;* the phenomena of *your* consciousness belong to *you;* and so on, through all the infinite number of groups of such phenomena. To say this is to affirm some sort of peculiar connection between all the phenomena of one group and whatever is meant by the word "me," and a similar peculiar connection between all the phenomena of another group and whatever is meant by the word "you." Furthermore, the facts of my psychic life, as at present existent and made objects of knowledge for myself or for some other observer, are connected in a peculiar way with the past facts of this same life. The same thing is true of you and of every other psychical individual. We have, then, assumed by the very definition of psychology that psychic facts may be studied in their connections, and as belonging to the de-

velopment of the psychical or mental life of individuals. Indeed, it would not be improper from this point of view, to define psychology as *the science of the individual psychical or mental life.*

But the study of the phenomena of consciousness as they occur in their orderly connection with one another, and so constitute the mental life of this or that individual, would not alone give us a science of psychology. The phenomena of my consciousness must be investigated, as objects of knowledge, with a view to compare them with the phenomena of your consciousness; and both these, with a view to comparison with as many more similar groups and series of psychic facts as may become objects of knowledge. In other words, psychology compares, generalizes, etc., and strives thus to reach a description and explanation of all phenomena of consciousness, as such. It strives to found a science, not simply of my mental life, and of your mental life, but of all mental life. Yet here we must restrict the endeavor of the present treatise. Although data of animal and comparative psychology may be employed, such data will be used only so far as they throw indirect light upon human mental life. It is the psychology that makes the facts of *human* mental life its objects of knowledge, its immediate data of scientific study, which we are about to pursue.

§ 4. It is not intended to discuss the question whether such a thing is possible as a science of "psychology without a soul," in the sense in which M. Ribot and others would have us pursue such a science. But the meaning of the words "me" and "you" and "him," and the processes by which the conceptions corresponding to these words are formed, it does belong to psychology as descriptive and explanatory science to consider. And if we find any assumption of a so-called "real and unitary being" entering into these complex conceptions, this assumption, too, must be noticed, and, if possible, explained. Such an assumption is itself a psychic fact of grave importance in determining the laws and forms of mental life. Nor can we wholly agree with those who regard hypothesis as necessarily useless, or even misleading, for purposes of scientific explanation. On the contrary, we regard this hypothesis as capable of use in such a way as to assist, rather than to hinder, psychological science. At the same time it is proposed to remain faithful, as far as possible, to the conception of psychology as a science, and therefore to exclude metaphysical discussions regarding the real existence of mind, its unitary being, place in the world of physical things, real connection with the body, its immortality, etc.[1] This exclusion of meta-

[1] Our success in carrying out this endeavor will be tested by the method and results of the whole book. We are hopeful, however, of succeeding better than—for one example among many—Höffding has done, who, after abjuring metaphysics in the form of both materialism and spiritualism, as forming no part of empirical psychology, proceeds at once to a rather long and unsatisfactory argument in support of monism—and this at the very beginning of his treatise (Outlines of Psychology, chap. i. and ii.).

physics, however, cannot possibly be extended so far as to cover the assumptions involved in the ordinary language of consciousness. "As of old, I am I, thou art thou"—this is not simply the utterance of poetic fancy; it expresses both the universal distinction and the universal process of generalization and unifying, the metaphysical assumption, on the basis of which alone the very beginnings of psychological science are possible.

§ 5. Following the derivation of the word (ψυχή, "soul," and λόγος, "reasoned account"), it was formerly customary to say, "Psychology is the science of the soul;" or (since the word "soul" may be felt to be fraught with religious and theological prejudices) "Psychology is the science of the mind." Thus Sully and Höffding have, in this regard, followed the "old psychology." Nor should we feel any insuperable objections to this definition, if it were certain to be kept in mind, as Lotze says in his "Outlines of Psychology," always at the beginning to use the designation "soul," or "mind," "with the proviso of future proof." The word "mind," and even the word "soul," we shall feel at liberty to employ from the beginning of our scientific investigation onward. But these words will at first mean for us only what everybody means whose mental life has developed sufficiently to make the distinction of *meum* and *tuum* as respects facts of consciousness; and from the standpoint of ordinary adult intelligence, to distinguish "I" and "you" and "he" from one another, and from the things which, when speaking without figure of speech, we call "it." What is further meant by these and other kindred words it is the task of psychology to investigate.

The Problem of Psychology must be understood in accordance with the conception of the nature of psychology which we have just accepted. Allowing ourselves a certain helpful repetition, we may say: The problem of psychology is to describe and explain the phenomena of consciousness—the facts of psychic or mental life, as psychic, and known as psychic, *i.e.*, as objects of knowledge. Using a somewhat different form of expression, it may be said: The problem of psychology is to understand the mental life, its phenomena, conditions, and laws. It is science which is aimed at;—*science*, as distinguished from popular impression and opinion, or from merely artistic and poetical representation, however interesting and true. Such scientific treatment of psychic facts involves both description and explanation. To attempt explanation, without accurate observation and careful description of the facts, is to doom one's self to faulty generalizations. Here, as everywhere, the frequent return from theory and statement of so-called "law" to the face-to-face experience with actual life is essential. The constant cry of the genuine and skilful psychologist is this: "Let us go back now and look the facts in the face." But to rest satisfied with mere description is to stop short of science. For purposes of description the delineations of psychic life in which history, literature, and art

abound are indeed invaluable. But the narrative, or the dramatic and artistic description of life is, as yet, only material for science; the expert and trained psychologist, by use of methods and conclusions belonging to modern psychological research, must explain facts, discover laws, trace the genesis and development of this life, and so construct the science of psychology.

The explanations which scientific psychology offers for the phenomena of consciousness are chiefly of two kinds. These are, first, the analysis of complex states of consciousness into their simpler factors, or elements, and the discovery of the laws of the combination of these factors; and, second, the tracing of the genesis and growth of mental life. This second kind of "explanation" may, in its turn, be subdivided: (1) The genesis of the individual states of consciousness, as they arise and succeed each other in time, demands explanation. Psychology endeavors to set forth in definite terms on what conditions of physical environment, and under what relations to preceding psychic conditions, each state of consciousness occurs. It necessarily regards the states of consciousness as associated, and considers all present states as dependent, under law, upon preceding states. But (2) psychology also endeavors to give a systematic exhibition of the general laws which control the evolution of the individual man's mental life. If we employ these words in a cautious, provisional way, we may say it investigates "the becoming of the soul," the genesis and growth of mind in individual man.

It is obvious, then, that all states of consciousness, regarded as possible objects of knowledge, offer—nay, themselves are—problems for the psychologist. The crowd staring at a spectacle, the astronomer gazing through the telescope at a star, and the bacteriologist peering at a microbe through his microscope, are in states of so-called perceptive consciousness. But perception, as a state of consciousness—perception as such—is a psychological problem. It is rather a vast and complicated network of problems. The lover of music while listening to the composition of a great master, the admirer of nature in the presence of Mount Blanc or of Fuji, the unanæsthetized sufferer under the surgeon's knife, are in states of feeling consciousness. And feelings, as such, offer many problems to psychology. Each state of consciousness teems with interesting problems. *But the one problem over all is to understand the real nature of that mental life of which all states of consciousness are members and parts, and the conditions and laws which control its genesis and development.*

§ 6. Different statements have been given by different writers to the problem which psychology pursues. Thus Beneke holds that it is the business of the psychologist to give, for every form of manifestation which occurs in the developed soul, "definite and sharp demonstration through what processes, and by combination of what factors, it originates."[1] Another writer declares,[2] in a more ambitious way, that the one quite definite purpose of a scientific psychology is "the reduction of all the processes of the soul to one simple psycho-physical element." [But this way of stating the problem of psychology plainly implies the very doubtful double hypothesis that all psychic processes may be reduced to one, and that this fundamental process is a so-called "psycho-physical" process.] And Herbart[3] conceived the aim of psychology to be the "demonstration of the connection of that which admits of being perceived in consciousness (facts of consciousness), by means of that which does not attain such perception—in accordance with general laws." While the most distinguished modern psychologist from the Herbartian point of view[4] affirms: "Psychology is that science which has for its problem the explanation of the general classes of psychical phenomena, by means both of mental representations as empirically given, and also of the speculative concept of mental representation in general, according to the universal laws of mental life."

We consider it much safer and more scientific, however, to conceive of the problem of psychology, when entering upon its pursuit, so as to exclude the admixture of doubtful theories often devised in answer to the problem.

§ 7. Our view of the problem of psychology assumes that a description of the phenomena of consciousness is possible which shall be sufficiently accurate and comprehensive to serve as a basis for an inductive science. But in order that these phenomena, or facts, may be employed as data for a scientific treatment, they must—as has already been said—become objects of knowledge. Now, it is admitted by all that mental phenomena can become objects of *immediate* knowledge only by means of so-called introspection or self-consciousness. I can stand, as it were, face to face with the phenomena only of my own mental life, you of yours, and so on.

It is moreover implied in this statement of the problem of psychology that psychic facts are, as objects of immediate knowledge, more or less complex; and, at the same time, that they may be analyzed into their so-called component factors and the laws of the combination of these factors discovered. As M. Paulhan has said: "Every psychic fact is a system—a synthesis of facts more or less perfectly coördinated." Such a system admits, in the hands of psychological science, of being analyzed. Here Helmholtz's analysis of the single note of our ordinary musical experience is often taken as a typical example.

The fuller explanation and justification of these assumptions, too, must be left to subsequent examination. We are reminded again that our definition is necessarily preliminary. But here again, also, we may safely trust, for the present, the universal belief as expressive of universal experience. All

[1] Pragmatische Psychologie, p. 42. Berlin, 1850.
[2] Horwicz: Psychologische Analysen, p. iv. f. Halle, 1872.
[3] Psychologie als Wissenschaft, I., p. 27. Königsberg, 1824.
[4] Volkmann von Volkmar: Lehrbuch d. Psychologie, I., p. 34. Cöthen, 1894.

believe that, in some sort, one may immediately and certainly know what one's own feelings, desires, thoughts, purposes, really are; and that some of these states, called by a common term, are more complex and highly developed than are others.

§8. Finally, it is assumed that the facts of consciousness may be successfully studied—nay, that they must be so studied, if we are to have any worthy scientific system—in the light of the conception of *development*. But *what* develops? The most obvious answer certainly is: The soul or mind of the individual man develops. In this answer, however, we surely detect metaphysics creeping in, with its subtle and ever-present assumptions. The truth is, in our judgment, that no doctrine of evolution is possible without a host of metaphysical assumptions. Yet all we care to have admitted, at the outset, may be summed up in this statement: The facts of consciousness which "belong" to every psychic individual may be arranged and explained on the hypothesis that the later depend on the earlier, the more complex on the more simple, the particular on those belonging to the species, etc. In brief, it is possible to describe, as conforming to certain conceptions of law and order, the history of a human mental life.

The true conception of psychology may be further expanded by considering, briefly, the Relations in which this science stands to several other closely allied Forms of human Knowledge. Here it is necessary to notice, especially, only its relation (1) to certain allied particular sciences, and (2) to that form of inquiry and opinion which we call philosophy.

The really notable thing about the relation of psychology to the physical sciences in general is that it differs from them by dealing with a quite different order of facts, and that it is the threshold or gate of entrance to the study of another main group of sciences—namely, the so-called psychological sciences. It has often been claimed—and especially of late—that because the phenomena of consciousness are peculiarly related to certain forms of physical development, therefore such phenomena ought to be subjected to treatment similar to that given to these forms of development. It has even been proposed to make psychology a dependent branch of biology, or to reduce psychology to terms of general nerve-physiology or of cerebral physiology. But so far as empirical psychology is concerned, the data with which it deals stand in no fundamentally different relation to the science of living organisms, or of the nerves and brain, from that in which they stand to physics in the form of optics or of acoustics. Both physics and physiology expound to us certain connections of psychic facts with other facts, certain conditions on which phenomena of consciousness arise and change. Both are, therefore, to be employed in explaining the genesis and growth of mental life. But bio-

logical facts, as such, and physiological facts, as such, are no more *like* the phenomena of consciousness, as such, than are other physical facts. Nor can biology and physiology put forth any more defensible claim to absorb psychology than can optics and acoustics. The "explanation" of psychic facts by reference to the relations which they sustain to known biological or physiological facts is indeed a most promising and fruitful branch of psychological method; but this does not in the least diminish the claim of psychology to an independent position among the particular sciences. In one sense of the words, there are no "independent" sciences, because there are no isolated or independent realities. In another sense of the words, psychology is by far the most independent and stable of the sciences. And if all the sciences were ever to be absorbed in any one, psychology is best fitted to be that universal science. For what are the other sciences but orderly or half-disordered systems of conceptions? And are not all conceptions facts of human consciousness?

On the other hand, psychology is undoubtedly the necessary preliminary discipline, or "propædeutic," to all the sciences of man. The sciences, of economics, politics, sociology, and even of history, hermeneutics, and æsthetics (so far as we can speak of such sciences), involve the immediate facts and laws of human mental life. The subjects with which these sciences deal cannot be in the highest degree scientifically understood, without a thorough knowledge of psychology.

§ 9. We take this occasion to protest earnestly, but briefly and once for all, against the assumption that, because the so-called "old psychology" was for a long time stationary, while modern biological and physiological science have contributed much by way of stimulus, method, and results to psychology, therefore the latter is not to be classed among the sciences, on an equality as respects independence with the others. Nor do we find less unwarrantable the claim that the only fruitful method of studying psychic facts is physiological or biological; or that the only truly scientific explanation of such facts must be sought for in physiological facts. These claims are not, indeed, necessarily connected with the proposal to study psychology as a "*natural* science." If they were so connected, it would be a sufficient reason for denying that psychology is a "natural science." This expressive term simply embodies the obvious truth that phenomena of consciousness occur in such connections as admit of being examined and partially, at least, reduced to general terms, within the realm of "nature" —in the larger and equally appropriate use of this word. Moreover, it seems to us a procedure highly prejudicial to the interests of scientific psychology when philosophers so thoughtful as Mr. Hodgson, and psychologists so brilliant and suggestive as Prof. James,[1] virtually assert that there

[1] See The Principles of Psychology, I., chap. i., vi., vii., and *passim* in both vols. New York, 1890. Also articles in the Philosophical Review, i., 1, pp. 24–53, and i., 2, pp. 146–153.

can be no science of psychology except a cerebral psychology. At the same time, we have ourselves diligently cultivated, and gratefully acknowledge our indebtedness to, that branch of psychological investigation which is called physiological.

The Relations of Psychology to Philosophy are so close and peculiar that it is impossible strictly to separate the two, whether in theory or in actual execution, while treating with scientific system the phenomena of consciousness. As Wundt[1] has well said: the partition of sovereignty between the two is an abstract scheme, which, in the presence of actuality, always appears unsatisfactory.

All the principal problems into which the attempt to explain psychic facts leads the investigator, themselves lead to the greater and profounder problems of philosophy. Psychology is then the special propædeutic to philosophy. On the other hand, we have already seen how difficult it is to keep even a provisional conception of psychology clear from what some would consider unwarrantable metaphysical assumptions. Philosophy, then, in the form of opinions and assumptions, almost necessarily underlies much of our psychological discussion. For example, scientific psychology is forced to recognize a certain conception to which the word "ego" corresponds, as entangled, so to speak, in the facts of consciousness. It is compelled to analyze this conception, and to describe its genesis and growth. But such work is difficult to keep distinct from metaphysical discussion as to the unitary nature and real being of the soul, considered as the truly existent subject (or *Träger*) of the states of consciousness. Where, in the pursuit of this problem, does descriptive and explanatory science end and philosophy begin? It is not easy to answer. Similar difficulties accompany the thorough discussion of all the important problems of scientific psychology.

In spite, however, of this unavoidable temptation to mingle philosophy and psychology, we shall succeed, in the main, in pursuing our chosen way by using the methods of empirical science. We shall describe and explain the processes and products of mental life; we shall even recognize the more important beliefs and assumptions which the psychic facts actually imply; and then we shall make our bow to metaphysics, and pass by the discussion of the ultimate import of the facts, and of the validity and ideal value of the beliefs and assumptions implied by the facts. Such discussion belongs more properly to the Philosophy of Mind.

[1] System der Philosophie, pp. 5 and 21 f.

§ 10. The history of psychological science might be freely appealed to, in order to show how inseparable are the relations between this science and philosophy. The persistent use of the term "mental philosophy," the large amount of matter in almost all treatises on psychology which is more properly classed under metaphysics or theory of knowledge, the constant transgression of the resolve not to introduce speculative philosophy into the empirical investigation of phenomena of consciousness (a form of transgression in which those who most decry philosophy or metaphysics are often especially guilty) —all these facts are significant of the same truth.

The distinction between psychology and philosophy as drawn by Professor Seth and Professor Croom Robertson is especially interesting. The former[1] explains that psychology regards the fact of intelligence "simply as fact, in which case the evolutions of mind may be traced and reduced to laws in the same way as the phenomena treated by the other sciences (psychology, *sans phrase*)." But "it is with the ultimate synthesis that philosophy concerns itself; it has to show that the subject-matter with which we are dealing in detail really *is* the whole, consisting of articulate members." The latter[2] would have us notice that psychology "is occupied with the natural function of *Intellection* (knowledge as mere subjective function), seeking to discover its laws and distinguishing its various modes. . . . Philosophy, on the other hand, is theory of *Knowledge* (as that which is known)." It will be noticed that both these authorities are distinguishing the psychology of intellection from the philosophical theory of knowledge.

§ 11. The double manner of dealing with the subjects of ethics and logic, which has always prevailed, is another proof of the necessarily intimate relations between the empirical science of psychology and all philosophical discipline. As sciences, based upon the facts of consciousness, logic and ethics have no independent standing: they are simply branches or departments of psychology. But with the scientific treatment of logic and ethics, even when the point of view is avowedly empirical, the philosophy of morals (metaphysics of ethics), and the theory of being and theory of knowledge (*Logik*, after the Hegelian pattern), are always nearly certain to be intermingled in large quantities.

We may fitly close this brief discussion of the relations of psychology and philosophy by saying, with a recent German author:[3] "Psychology as a science has for its object of investigation the psychical phenomena, through which and in which the collective inner life exhibits itself, but not the being of the soul *per se*, to which the phenomena point as something over and above themselves."

[Besides the books to which reference has already been made, the following, among many others, may be consulted: On the Nature and Scope of Psychology. Sully: The Human Mind, I., chap. i. Baldwin: Handbook of Psychology, I., chap. i. Rabier (already referred to): Psychologie, chap. i. and ii. Brentano: Psychologie vom empirischen Standpunkte, bk. i., chap. i., and bk. ii., chap. i. Lotze: Metaphysics, bk. iii., chap. i. G. H. Lewes: The Study of Psychology, chap. i. to iii. Especial attention is called to the two monographs of Natorp and Spitta. See also Delbœuf: La Psychologie comme Science naturelle. On the relations of Psychology and Philosophy, see the author's Introduction to Philosophy, chap. iv.]

[1] Art. on Philosophy: Encyc. Brit. (9th ed.).

[2] Art. on Psychology and Philosophy: Mind, 1888, p. 156.

[3] Spitta: Einleitung in die Psychologie, p. 34.

CHAPTER II.

METHOD, SOURCES, AND DIVISION OF PSYCHOLOGY

No unnecessary mystery should, certainly, be thrown around the question of Method in Psychology. For in this science, as in every other, the means of investigation employed are such as experience has shown to be fruitful, both in ascertaining accurately and comprehensively the facts which are to serve as data for the science, and also (and especially) in explaining their origin and relations. To accomplish its purpose, psychology freely avails itself of all possible means at its disposal. In accordance with our provisional conception of psychology, we might say, then,[1] that all psychological method has these two things in view: 1, to certify the phenomena of consciousness; and 2, to explain them.

There has been almost as much debate over the true method of psychological science as over any of its more doubtful conclusions. This debate, however, has been largely confined to two questions: first, and especially, the possibility and value of so-called introspection; and, secondly, the usefulness and extent of experiment in the study of psychic facts. If, then, a reasonable position with reference to these two debated questions can be made clear, little further discussion of psychological method is necessary. Observation of the phenomena of consciousness, both direct observation and indirect; analysis of these phenomena, both by consciousness "envisaging" them and reflecting upon them, and also by the use of all possible experimental means; induction of laws, and inferential and speculative construction of the principles which control the genesis and growth of mental life—such is the mixed method which psychology more or less successfully employs.

In other words, psychological science is (1) observative of facts, (2) analytic, (3) inductive, (4) genetic. The difficulties, dangers, mistakes, and triumphs, of this the true scientific method it shares in common with the whole sisterhood of sciences. It

[1] Comp. Spitta: Einleitung in die Psychologie, p. 40 f. (*zu vergewissern* and *zu erklären*, the phenomena).

has, however, certain special difficulties and dangers as well as certain peculiar advantages and successes. These are mainly due to the nature of introspection, or reflective consciousness, and also to the fact that the sphere is limited within which the definite experimental methods of the allied natural sciences can be successfully used.

§ 1. Debate as to the propriety of founding a *science* of the mind upon the "immediate awareness" of the individual, respecting what goes on in his own mental life, is by no means new. As long ago as Aristotle it was held that there can be no "science" of the individual. Since, therefore, introspection can never furnish anything beyond what the individual seems to himself to know of his own individual state of consciousness—a particular psychic content of some particular psychical being—introspection can never constitute the sole method of mental science. By this method, it is said, we obtain, at best, only the new and fleeting psychic fact that I appear to myself, here and now, to be in such a so-called state of consciousness. Only by memory can I know that I *was* in another state of consciousness, which may be recognized as similar, and so made the basis of a classification and scientific explanation of even my individual mental life. And as for those psychic facts which belong to other individuals than myself, every one admits that it is impossible to know them by introspection.

Such trains of thinking as the foregoing have led certain writers not only to deny the possibility of founding a science of psychology upon introspection only, but also to deny that introspection can render back to us even our own mental states as true objects of knowledge. And so we are brought to the palpably absurd proposal that we should abandon all effort to certify the facts of consciousness, as facts, by the method of considering what they immediately are in our own mental life. (So, virtually, writers like Comte, Lange, Maudsley, *et al.*) On the other hand, the majority of even modern treatises on psychology reaffirm the method of introspection without very clearly fixing its limitations or appreciating its real value. One writer, for example, declares: "The way to psychology is, first of all, perception of a soul by a soul." This perception is *self*-perception, which is, therefore, the "chief and indispensable method of psychology."

§ 2. The risks, limitations, possibilities, and proper uses of introspection in psychology can only be made known in connection with the development of the science itself. For the discussion of psychological method is complicated with the discussion of the nature of consciousness and self-consciousness, of attention, of memory, of the genesis and growth of the conception of "self," of time-consciousness, and of many other subjects. It may be premised, however, that many of the difficulties ordinarily raised are due, largely or wholly, to "fallacies of the psychologist." They cling to what the psychologist *thinks about* the use of introspection; they do not necessarily belong to the real nature and actual use of introspection. Those writers who claim that one can never immediately know what one is now thinking, feeling, and willing, are invariably found to hold conceptions as to the nature of knowledge, as to the nature of that time of which we have experience (the "now" of self-consciousness), and as to the meaning of the word "imme-

diate," etc., which are abstract and remote from the actual life of the mind. That some knowledge—immediate, trustworthy (though not necessarily infallible), and capable of being made into data of a science—is attainable regarding the phenomena of consciousness, forms the presupposition, not only of all study of psychology, but also of all human intercourse. *We begin, therefore, by assuming, in a preliminary way, the general truthfulness of the universal impression concerning the nature and value of introspection as a means of knowing the phenomena of consciousness.*

Observation of the phenomena of Consciousness is of two general classes—direct and indirect. Direct (or immediate) observation is that form or phase of conscious mental life which is called "self-consciousness." When such immediate observation is employed, with purposeful attention, for the ascertainment of the psychic facts actually occurring in any individual mental life, and for the analysis of such facts, it becomes the so-called "introspective" method in psychology.

In spite of all objections which may be urged, and of all difficulties raised against the use of introspection as scientific method in psychology, the following position may be maintained: *Direct observation of psychic facts is able not only to render these facts to us as true objects of knowledge, but also to a certain extent to assist in the analysis of the complex life of adult consciousness into its simpler component elements.* Only on the supposition that psychic facts *may* be made immediate objects of knowledge can psychological inquiry be instituted and psychological science enter upon its work. The preliminary but necessary conception of psychology shows that scientific psychological inquiry begins by asking, What *are* the facts called "phenomena of consciousness?" and that these facts, in so far—and only in so far—as they can become objects of knowledge, furnish the data of the science. But "phenomena of consciousness" are "internal" facts; the two phrases are intended to mean one and the same thing. These facts, *as such* (and "as such" they constitute the data of psychology), are, by their very nature, capable of being known only in and through consciousness. All other knowledge of them is indirect; that is, it is through objective signs and by interpretation of such signs. But, here again, what the signs really signify is determined by new facts of consciousness, alike capable of being immediately known only by the observer of the signs; and interpretation itself consists of nothing but certain facts in the conscious life of the interpreter, the nature of which he knows as facts of his own consciousness, and which he believes, suspects, or knows to represent other facts of another individual's consciousness.

Moreover, here, as in every other form of science, training of the powers of observation is most important in its effect upon the data of the science. Here, too, as elsewhere, different observers show great differences in natural tastes and aptitudes, in what we are accustomed to call "natural powers." Some are much given to observing their own mental states; they do this with an interest which may become almost as purely objective as that of the observer of the amœba through a microscope. Others are always reluctant and generally unskilful in the observation and description of their own mental life. What is here especially important to notice is this, that much skill and success may be attained by intelligent practice in the analysis of one's own mental states with the instrument of introspection. For not only can one make the mental state in which one here and now is an object of one's knowledge, but one can also train one's self to note the genesis and growth of mental states; and by rapidly directing attention to the various phases, aspects, and elements, of the complex and changing mental life, one can recognize in a limited way the various "stuffs," so to speak, out of which the complex wholes are successively compounding themselves under one's eyes. To tell the ordinary observer: "You cannot discern in detail before the mind's eye, your own mental conditions, and certainly know; I here and now think about this, or perceive that complex object of sense, or feel such a manifold pleasure or pain, or form such a complicated purpose"—is to tell him, in the interests of psychological theory, what he rightly believes to be contradicted by the frequently recurring experience of life. To tell the trained psychologist, who does not accept the fanciful denial by other psychologists of that real activity which we call immediate self-consciousness: "You cannot, by so-called introspection, analyze your own states of consciousness," is to declare theoretically impossible a scientific feat which he knows himself constantly to be performing. Such arguments resemble those by which motion is proved to be impossible, or the antinomies of space and time are established.

While admitting the possibility, within certain limitations, of obtaining trustworthy immediate knowledge of psychic facts by the method of introspection, we by no means deny the difficulties and dangers which accompany its successful use. All scientific method in observation needs to be guarded in its employment; all observation of phenomena is apt to encounter difficulties and liable to engender mistakes. Prejudice, haste, admixture of undue inference and expectation as to what will be

observed, or ought to be observed, and various other sources of corruption and mistake, exist in connection with the inspection of all objects of knowledge. Moreover, it must be admitted that psychic facts are peculiarly difficult of direct analysis under observation. For this, four principal reasons may be given: they are subtle and complex in their composition, rapid and difficult to follow in their changes, alterable—swiftly and largely—by the very act of attention which makes them objects of knowledge, and characterized by a high degree of individuality.

§ 3. It would be difficult to make the absurdity of denying *in toto* the scientific value of introspection any more obvious than it is the moment we appeal to real life and to individual experience. Without too great risk of tedious repetition, however, it may be said that certain of the most forceful arguments of those who credit this denial would, if strictly interpreted, render impossible any immediate and trustworthy knowledge of any kind of facts. For example, we are told that the mental life is in a constant flux; and that, therefore, no one phase of that life (no so-called "state of consciousness") can exist without at once being dissolved in the onflowing current of this life. Hence, psychic facts, it is claimed, cannot be objects of observation long enough to become objects of knowledge. But the same thing is as certainly true, if not true to the same extent, of objects of external observation. When an observer watches an amœba under the microscope, or the image of the spectrum upon a screen, his mental life is no less truly in a constant flux which carries along with it the object of his observation. Indeed, the only defensible psychological doctrine, as we shall subsequently see, holds that every object (the amœba or the image of the spectrum) is, as an object, unceasingly constructed, dissolved, and reconstructed anew, by mental activity, during the entire process of observation. The existence of any external object, as an object of immediate knowledge through the senses, is momently dependent upon the fixation and wandering of attention, and upon activities of memory, imagination, and thought. For memory, imagination, and thought are not faculties that can be exercised apart from perception through the senses, and apart from self-consciousness; neither can there be any immediate knowledge of objects, whether external or internal, whether by perception or by self-consciousness, which does not involve memory, imagination, and thought. If, then, the dependence of introspection upon the activity of these other mediate and fallible faculties constitutes a reason why we cannot regard the deliverances of introspective consciousness as giving immediate and trustworthy knowledge of psychic facts, the dependence of all external observation upon the activity of the same faculties will force us to conclude against the possibility of immediate and trustworthy knowledge of any of the data of the physical and natural sciences.

§ 4. The degree to which the knowledge of complex mental states may be carried by trained introspection cannot, from the very nature of the case, be definitely fixed. The changes which the growth of this power under training brings about are likely to be plainly remarked by one who has had intel-

ligent experience of them. For example, let a student of psychology who has a good ear for musical sounds train himself to recognize the overtones in the complex note of ordinary experience; or let him analyze, by immediate observation, his skin sensations, after he has been for some weeks experimenting after the manner of Goldscheider and others. It will be true that he has a richer experience of auditory or of skin sensations than he formerly had; but especially will it be true (and this is the important point for our present consideration) that he immediately *knows* that he has this richer experience, because he can detect more elements in the complex sensation-state than was previously possible.

Daily experience also proves that it is within the power of an observer to make something like an accurate analysis of his own complex mental states by means of introspection. Indeed, all adult minds are constantly doing this very thing. We hear persons describing, in a way which we have every reason to suppose fairly accurate, how they have felt, and what they have imagined, remembered, or resolved—all in some moment of horror, or of danger, or of joy. To be sure, this "moment" is not the mathematical point which constitutes the atom of time where the single state of consciousness can alone find position, according to the fallacious theory of some psychologists. But then there are, *in reality*, no such moments in the life of consciousness; and, of course, there are no simple, analyzable states of consciousness fully occupying such moments. But the discussion of the full bearing of this upon our view of the use of introspection must be postponed until later.

§ 5. The difficulty of introspective analysis of the so-called "feelings" has been so emphasized by many writers as to amount to a denial of the possibility of any immediate knowledge of our own states of consciousness, when they are predominatingly states of feeling. Thus the conclusion is enforced: I can never know precisely how I now feel as a matter of immediate cognition of present psychic fact; I can only have an idea of how I did feel a moment, or an hour, or a day ago. Feeling, then, must be ideated, to be known; and the particular form of the idea under which alone it can be known is the representative image. In other words, I can have an idea of how I *felt* at some past time; but I cannot immediately know how I *now feel*—especially, of course, if my present feeling be a rather intense one. Even so cautious a writer as Dr. Ward maintains: "Feeling as such is, so to put it, matter of *being* rather than direct knowledge; and all that we know about it we know from its antecedents or consequences in presentation."

The number of fallacies involved at every point in this general position will have to be exposed in their appropriate places. They are of the order to which reference has already been made. They come from substituting intellectual abstractions for the wealth in reality of concrete psychic facts. That the four chief difficulties of introspective analysis, as mentioned above, apply with peculiar force to so-called states of feeling, no one would think of disputing. The history of psychological science and the language of art and of common life prove this truth. But that I cannot immediately know that I am this moment angry at such an individual person or act; or filled with the emotion of love toward such another person or ideal object of con-

temptation; or in terror at this particular animal or inanimate object—this is something which it requires long dealing with misleading psychological abstractions to believe. On the contrary, it is often in moments of strongest and most richly varied feeling that, above all other moments, we *live* most; and also *know* most immediately and certainly that we live, and what our mental life here and now is.

Observation of psychic facts for purposes of a scientific psychology cannot, however, be confined to the direct or introspective method. For—as has already been pointed out—this would involve the attempt to build science wholly on the particular, as limited to an individual mental life. In truth, we can neither know others except through self-knowledge, nor know ourselves without comprehension and acute observation of our fellowmen.[1]

As Göthe has significantly said:

> "The gauge that from himself he takes
> Measures him now too small, and now too great.
> Only in man, man knows himself."

Indirect observation, or the ascertainment and certifying of the phenomena of consciousness through interpretation of the signs which other psychical beings give of their states of consciousness, is, therefore, an indispensable method of scientific psychology. Two things must at once be noticed with reference to all use of this method: First, all observable signs of the states of consciousness of other beings than ourselves necessarily consist of physical changes; such changes are primarily brought about in the physical organism of the conscious beings, and sometimes, secondarily, brought about in things dependent for their structure or changes upon the action of this physical organism. Second, all interpretation of such signs must be in terms of the observer's self-consciousness. He must think or imagine how the other individual thinks, feels, wills, etc. The method of indirect observation is, then, inevitably connected with, and dependent upon, the method of introspection. Without this the lament of Tourguenieff is absolutely true: "The soul of another is a darksome forest."

Psychological science, if it be nobly ambitious and faithful to its high mission, will regard all forms of the exhibition of human mental life with painstaking, unprejudiced, and loving

[1] So the couplet of the German poet runs:
"Willst du dich selber erkennen, so sieh wie die Anderen es treiben;
Willst du die Anderen verstehn, blick in dein eigenes Herz."

inquiry. Every sign of such life, actually furnished or artistically conceived, becomes for the trained student of psychology an object of interest. He desires to convert the state of consciousness which it signifies into an object of (indirect, but verifiable) knowledge for himself. Hence, all manifestations of psychic facts are watched for and scrutinized by him with sympathetic and yet scientific spirit. Psychological appetite, psychological insight, psychological skill in interpretation, arise and develop in this way. It is not arrogant to claim that the trained psychologist *understands* not only the child, the idiot, the madman, and the hypnotic subject, but also the artist, the scientist, the statesman, and the thinker, as psychical beings, far better than any of these classes of persons understand each other, or even themselves.

§ 6. It follows, from the position just taken, that, in order to a complete enumeration of the so-called *sources of psychology*, it would be necessary to classify all the principal forms of the manifestation of human mental life. For this achievement we should not have room, even if it were worth the time which it would necessarily demand. The one rule for the student of psychology—a rule which he carries about with him when far away from books or psycho-physical and biological laboratories—is this: Seize upon every manifestation of the psychical life, try to make it an object of knowledge, and try to explain it in accord with other facts and known laws of psychical life. From the infant to the adult Kant, from the idiot or madman to Aristotle, from the meanest subject to the statesman or the emperor—all things psychical are yours, and are to be converted if possible into integral parts of your psychological theory.

We now enumerate, however, several of the more important sources of psychology which are open to indirect observation:

(1.) The artistic delineation of life, in every form of such delineation, is a most valuable source of psychology. This includes the drama, poetry, and even the art of the painter, sculptor, and musician; it especially includes the modern novel, or prose romantic composition. All true art displays insight into life. But most artists, and especially most novel writers, are apt to succeed ill when they attempt to enter upon psychological analysis in a scientific way, or even attempt artistically to present the results of such analysis. While, for the trained psychologist, the great artists, even if unconscious of what, from the psychologist's standpoint, they are actually doing, are guides of the greatest value.

(2.) Social phenomena, and the historical or theoretical discussion of such phenomena, are another source of psychological science. The phenomena of savage life, and of the mental life of distant and strange peoples, have a certain value of their own. The institutions, habits, customs, laws, of different tribes and nations manifest their prevalent states of consciousness. Great caution is needed here, and great painstaking really to enter, through the gateways of the phenomena, into the temple of the real mental life. The

so-called "old psychology" suffered from failure to use this source. It was too narrow and individualistic—a Puritanic psychology, or a Teutonic psychology, or a French psychology, or the description of the mental life of the common-place, middle-class Englishman of the writer's time.

(3.) Abnormal and pathological phenomena are also a helpful source of psychological science. In every science of living beings the normal and sound phenomena, so called, are fully understood only when studied in connection with the abnormal and pathological. Hence the value of studies in insanity, hypnotism, criminology, idiocy, etc., for the science of psychology.

(4.) Observation of the phenomena of infant and child life is particularly necessary for the successful use of the genetic method in psychology. Such observation leads, almost directly, to a better analysis of our own adult states of consciousness and to the detection of hitherto concealed factors within them.

Under this same class of sources we may bring so-called "comparative psychology," or the study of the phenomena and evolution of the conscious life of the lower animals. But here, as well as in the study of infant mental life (and even much more emphatically), all conclusions must be very cautiously and doubtfully drawn. What really *psychic* facts are signified by the external signs, and how far there are any states of adult consciousness which will enable us even to present ourselves with a meagre picture of the states of animal consciousness, *as such*—about this, it is difficult or impossible to attain certainty. In other words, we can scarcely be sure of our power to convert states of animal consciousness into objects of the psychologist's knowledge—even of knowledge as gained by indirect observation and hypothesis. There can be no doubt, however, that those biologists who attempt a science of the mental life of the lower animals need nothing more imperatively than what they customarily lack—namely, a scientific knowledge of human psychology.

(5.) Reading is another valuable indirect means of acquiring a knowledge of the phenomena of human mental life. For psychology, like every other science, grows at the hands of many workmen, and there is a "soul of truth" in all views, however distorted or erroneous they may at first appear.

Experiment, as a method of observation and analysis of the facts of psychic life, has become in these modern times a most valuable and even indispensable means for constituting and improving the science of psychology. On the use of experiment in psychology, however, we can sympathize with the extremists of neither extreme. For, on the one hand, it does not seem that experiment is likely to prove capable of coping with some of the most profound and interesting problems of psychology. On the other hand, it is clear that under the appropriate limitations, experiment may be a valuable aid in disentangling the factors and tracing the genesis and growth of certain states of consciousness, as well as in demonstrating under what definite physical and physiological conditions the different states arise, combine, and succeed each other in the entire mental life. To

fear psycho-physics and so-called physiological psychology, or to attempt to substitute psycho-physical experimentation for all introspective study of mind, for all survey of the creations of art, society, and politics, in the field of mental evolution, and for all theoretical construction on the basis of legitimate metaphysical hypothesis, seems to us alike unworthy of the scientific student of mind.

It is, of course, neither easy nor safe to fix definite limits within which alone experiment in psychology shall be declared to be possible or capable of yielding assured results. Two things, however, will always be true of the experimental method in psychology. First: experiment belongs to truly *psychological* method only so far as it is constantly accompanied and tested by introspective examination of the phenomena of consciousness. Secondly: experiment gives us preliminary information as to the definite physical and physiological *conditions* under which the psychic facts, as such, arise, change, and pass away. But, here again, without introspection and trust in the introspective method, experiment gives us no psychical data or strictly psychological laws. And much of what has been discovered in this way belongs to physics and physiology, and not to psychology at all.

§ 7. The true impression as to the great value of modern experimental methods in the study of psychic facts can best be gained by some actual acquaintance with laboratory work, or with the literature produced by such work during the last two decades. Here the successes in the field of localization of cerebral function, in psycho-physics proper, in reaction-time, etc., may properly be instanced. Let any doubter follow the laborious and careful researches which have disentangled from confused and complex states of predominating bodily sensations the elements to be assigned respectively to skin, to joints, to muscles, and perhaps also to primarily central physiological processes. Or, taking up the wonderful new views as to sensation-complexes which originate in irritation of the skin alone, let him investigate experimentally sensations of heat, and sensations of cold, and light-pressure sensations, and dull-contact sensations, and tickle sensations, and motion-sensations, and prickle sensations, and indescribable new sensations —many or all of which are stirred and fused in a single "field of consciousness," so called, when any large area of this important sense-organ has its multitudinous points simultaneously excited.

§ 8. We are cautioned against arbitrarily limiting the sphere of experimentation in psychology, in view of the attempts now being made to discuss by use of this method the phenomena of so-called "free-will," or of the more complex associations of ideas, etc. Even the ethical, æsthetical, and religious feelings are, we are told, to be made subjects of experimental observation and analysis; while, if we are to trust M. Charcot and his

school, it has been experimentally demonstrated that certain fundamental changes are necessary in our conceptions, not only of mind, but also of the objects with which physics scientifically deals. The psychology of the multitude is also being investigated by the proposed application of simple means of experiment to the great body of the children by the help of all the school-mistresses of the land. All this is certainly very hopeful and interesting.

On the other hand, certain barriers, beyond which it will be difficult or impossible for experimentation to pass, may be stated with a reasonable confidence. Only the simpler states of consciousness, in respect of their sensory and motor factors, readily lend themselves to study by the strictly experimental method. The quantity, quality, combination, time-rate, and succession of the elementary processes belonging to the sensory-motor basis of the mental life furnish the subjects which are best (if not exclusively) adapted to this method. How much there is that is beyond its reach, the unprejudiced use of this very method reveals. The truth of our view this entire treatise will make abundantly clear.

§ 9. The experimental method reveals nothing about psychic facts, *as such*, unless the subject of the experiment in some way reveals, in terms of consciousness, what his states of consciousness actually are. The question which the experiment asks the subject to determine always is: "How did you feel, or what did you perceive or think, or what did you will, when such a physical event (known or unknown to him) occurred?" Thus it is an appeal direct to self-consciousness and memory which experimentation always makes. If neither question nor answer makes any reference to states of consciousness, directly known by the subject as such, then the experimental inquiry is not *psychological* at all.

The *science* of psychology, as descriptive and explanatory of states of consciousness, undoubtedly consists very largely of knowledge about those physical and physiological conditions—antecedent or concomitant—upon which the states depend. But we have already made our protest against the doctrine that these are the only conditions which it behooves psychological science to investigate.

To observation, direct and indirect, and to analysis by introspection, reflection, and experiment, we add Induction—as the necessary method of psychological science.[1] In psychology the function and place of the inductive method does not differ from that maintained by this method in the other particular sciences. The character of induction and the validity of it as general scientific method, it belongs to special treatises on this subject to set

[1] Volkmann denies that, properly speaking, induction can be the method of psychological science (Lehrbuch d. Psychologie, I., p. 6 f.). Indeed, he rejects both the deductive and the inductive method, and adopts what he calls the "genetic" method as the only true one. His argument against many of the faults and failures of the ordinary use of induction in psychology is undoubtedly very forceful. What is called induction too often uses unwarrantable abstractions—whether of so-called faculties or psychic factors and processes, such as raw undifferentiated "mind-stuff," or unconscious psychic atoms and "aggregations," "integrations," "re-dintegrations," and what not—as though they were entities or activities in concrete mental life.

forth. There is little or nothing, at once special and noteworthy, concerning the application of this method to facts of mental life which it is necessary for us to consider. We begin the study of psychology with the general assumption that, by diligence and skill, order may be introduced into what appears at first an indistinguishable mixture, a chaotic mass of psychic facts. Here, as elsewhere—we say hopefully—law must reign: and it is possible for us to find it. We compare psychic facts here with psychic facts there, psychic facts just brought to our knowledge with psychic facts known of yore or of yesterday; we classify, generalize, frame hypotheses, and test the hypotheses by trying with them better to analyze and to explain new psychic facts. In brief, we construct and verify generalized statements as to the orderly modes of the structure—so to speak—of man's mental life. So often as our so-called "laws" are proved to be wrong, inadequate, or defective at any point, we amend, expand, and improve them. And from the simpler and less comprehensive generalizations we strive to rise to those which are more difficult to make and to justify, because they comprehend so many facts and involve so many minor laws. Here, of course, the so-called inductive method implies—strictly speaking—deduction as well as induction, and both analysis and synthesis, after the fashion of the science-making mind of man.

But over all hovers the conception of Development. We desire to treat the mental life as a totality, where, as far as possible, the great principles of its genesis and growth shall be made known. Only thus can each particular fact be better understood, as seen in the light of these principles; only thus can each stage of this life be satisfactorily explained in its necessary dependence upon the preceding stages. The ideal of our science is, to be sure, an exalted one. It may be a long time before it can be realized; it may, indeed, never be realized. But none the less, it is the ideal alone fitted to stimulate, encourage, and guide our scientific investigations;—and not our investigations alone, but those of the whole race of men, in so far as they may be made interested in the science of their own mental life. It is in the formation of such a comprehensive view of the development of all mental life that the so-called "Genetic Method" is most effectively employed.

§ 10. To endeavor to confine the inductive method in psychology within the same details of treatment as those found appropriate to the physical sciences is to render it relatively unfruitful from the very outset. Statistics and the records of long series of psycho-physical experiment are of undoubted value; but the collection and criticism of such data is not the only basis for

valid induction in psychology. The rather must all classes of psychic facts, however discovered, have their due place and influence in our induction.

In Germany Herbart and his followers have endeavored to use the genetic method for the solution of particular psychological problems, as well as for the formation of a complete scientific picture of mental development. In carrying out this endeavor, however, they have avowedly introduced metaphysical presuppositions which we consider unwarrantable. Volkmann, the ripest product of the Herbartian school, adopts the genetic method, although he claims that "the dialectical history of the development of the spirit is not a history of development at all;" and that "the so-called stages of this development are hypostasized abstractions"—a criticism which is, of course, aimed chiefly against Hegel. Beneke was the first in Germany to attempt the genetic method, discarding metaphysical assumptions and building upon a scientific basis. The traditional old-fashioned English psychology has confined itself largely to analysis. There can be no doubt that the genetic method is destined to achieve some brilliant successes in the near future; although incessant painstaking is necessary to avoid being deceived by misleading figures of speech brought over from the fields of physical science. For example, many of the psychical entities of Mr. Spencer are quite as much "hypostasized abstractions" as are those made use of in Hegel's "Phenomenology."

The Divisions of the whole field of psychology are generally given as two: Empirical Psychology and Rational Psychology, or the Philosophy of Mind. The field of empirical psychology is customarily divided according to the three so-called Faculties of Intellect, Feeling, and Will. Since we have decided to exclude, as far as possible, all problems of so-called rational psychology and to treat of mental phenomena in terms of descriptive and explanatory science, and since we regard the customary discussion of the "Faculties" of Mind as defective and unscientific, we shall—in accordance with our conception of psychology and for purposes of the highest convenience—divide the entire subject as follows: I., Most General Forms of Mental Life; II., Elements of Mental Life; III., Development of Mental Life. The justification of this division must be left to the entire subsequent treatment of the topics concerned.

[Besides the chapters on Method in the various works on psychology, the following, among others, are especially worth noting: J. S. Mill: Logic, bk. vi., especially chap. iv. Lewes: Problems of Life and Mind, third series, I., chap. iv. Volkmann: Lehrbuch, I., pp. 5-34. Brentano: Psychologie, i., chap. ii.-iv. Rabier: Leçons, etc., chap. iv. Wundt: Physiologische Psychologie (4th ed.), p. 3 f. Bain: Logic, bk. v., chap. v. James: Principles of Psychology, I., chap. i., vi., vii. Sully: The Human Mind, I., chap. ii. Interesting and helpful monographs are Mohr: Grundlage d. empirischen Psychologie. Spitta: Einleitung in d. Psychologie. Natorp: Einleitung in d. Psychologie.]

Part First

MOST GENERAL FORMS OF MENTAL LIFE

Part First

MOST GENERAL FORMS OF MENTAL LIFE

CHAPTER III.

CONSCIOUSNESS AND SELF-CONSCIOUSNESS

It should be understood that in psychology anything like a separate treatment of the principal topics, so that what is said under one head shall not be assumed or repeated under every other head, is quite impossible. The real relation of psychic facts and psychical faculties is such as to forbid that any clear and complete knowledge of those earliest treated should be obtained until some knowledge of those whose treatment comes later has been reached. No division of the general field can avoid this difficulty, for it grows out of the essential nature and uniform principles of the development of all mental life. In the three following chapters the difficulty will be especially obvious, because these chapters treat of those forms, or aspects, which belong to all actual psychic facts; the discussions brought forward in them are, therefore, necessarily connected with each other and also with all the details treated in the two following parts of the book.

The term Consciousness has already been used as synonymous with all truly psychic facts, in so far as such facts can become objects of knowledge, and so be considered as data for scientific psychology. This use our preliminary definition of psychology assumed to be justifiable. But it is necessary that we should now clear up further the conception corresponding to this term, and present some statements as to the conditions of consciousness, the universal structure, so to speak, of all states of consciousness, the "circuit" of consciousness, the "flow" of consciousness, and other similar topics.

The Meaning of the term Consciousness, in its widest and vaguest significance, does not admit—strictly speaking—of being

defined. In other words, the marks of the concept of consciousness cannot be enumerated without implying, in each one of them, an understanding of the fundamental experience to which the concept itself corresponds. Figuratively speaking, consciousness may be said to be the one universal solvent, or menstruum, in which the different concrete kinds of psychic acts and facts are contained, whether in concealed or in obvious form. Is there a truly psychical phenomenon, an occurrence of real mental life, anywhere: then such phenomenon is a phenomenon *of* consciousness, an occurrence *in* consciousness. On the other hand, consciousness is no existence, or abstract form of mental life, apart from all actual psychic facts. Definition in general—the analysis which makes it possible to fix the meaning of concepts, and the synthesis of the results of analysis—is possible only by complex activity of consciousness. The meaning of every concept is all in the states of consciousness, reduced to their lowest terms, which mental growth of the particular concept involves. We attempt then to define the simplest of all by the more complex, the most fundamental by the less fundamental, when we attempt to give the meaning of the concept of consciousness.

We may, however, realize, as it were, what consciousness is by comparing it with the so-called "unconscious." But "the unconscious," considered as the contradictory of consciousness, is synonymous with *no* psychic state or fact; or, rather, it is the denial of any truly psychic state or fact: it is the *non*-psychical, in the same meaning of the word which makes the "psychical" equivalent to a phenomenon of consciousness. What we are when we are awake, as contrasted with what we are when we sink into a profound and perfectly dreamless sleep, or receive an overpowering blow upon the head—*that* it is to be conscious. What we are less and less, as we sink gradually down into dreamless sleep,[1] or as we swoon slowly away: and what we are more and more, as the noise of the crowd outside tardily arouses us from our after-dinner nap, or as we come out of the midnight darkness of the typhoid-fever crisis—*that* it is to become conscious. But, of course, "the unconscious" cannot be thought, since thought itself is only an orderly movement and sequence of states of consciousness. Nor can we define consciousness by contrast with the merely negative concept of "the unconscious."

In this most general meaning of the word, all phases, factors, and forms, of mental states, or psychic facts—all partial or

[1] Comp. Strümpell: Grundriss d. Psychologie, p. 15 f.

complete "psychoses"—are equally to be spoken of as belonging to, and falling within, the so-called "field of consciousness." The most blinding toothache, as well as the serenest contemplation of Deity, the obscurest mass of confused bodily sensations belonging to the early days of the infant, as well as the reflective self-analysis of the trained psychologist, is a phenomenon of consciousness. By this use of the word, however, we do not mean either to affirm or to deny the right of reflective science to refer to the being called *Mind* other activities than those which it may be said to manifest in consciousness. If this right were admitted, it would no longer be improper to speak of "unconscious" mental acts, or "unconscious" states of mind. In other words, the terms "mental acts" and "facts of consciousness" would no longer be throughout strictly convertible. And there are many of our common experiences which induce us to use this kind of instinctive metaphysics. There are also certain undoubted phenomena which scientific psychology can handle more satisfactorily by means of the hypothesis of unconscious mental activities. What, however, is now intended is this: abjuring metaphysics and attending only to the primary, attainable data for a science of psychology, it is a justifiable and necessary use of the word *consciousness* which makes it *synonymous with psychic facts in general.* Where there is no consciousness, there are no psychic facts as data for psychology; wherever there is consciousness, there already exist psychic facts demanding scientific description and explanation.

§ 1. The word "consciousness" has been used by different psychologists with a somewhat wide range of meanings; and—as was to be expected—in connection with this varying use there has been no little difference of opinion concerning the nature of consciousness. On the one hand, some writers have identified consciousness with self-consciousness as the so-called "power by which the soul knows its own acts and states" (so Porter: The Human Intellect, p. 83); or have spoken of it as an inner "witness," an "inner illumination," which gives us information about everything in the mind (Cousin: Psychology, chap. x.; and Hickok: Empirical Psychology, chap. iii., 2). Sir William Hamilton employed it as a collective term for the cognitive aspect, or factors, of all psychical states. On the other hand, many German writers, and recent writers generally, have rightly protested against identifying consciousness and self-consciousness; and also against the fallacy which assumes that an actual self-reference of every psychic fact, or state, to a subject (the *Ego*) is the necessary accompaniment of the very existence of such fact or state. This protest, when made in a lively way, may take the form of such questions as follow: Are we to believe that every psychic fact, as such, has all this mechanism concealed in its interior, as it were; this universal *double entendre*, or two-foldness of fact, as mere fact? As for me,

ordinarily when I hear a sound, the *hearing* is all there is of it; I do not, besides, consciously refer it, as something heard by me, to a self as the subject of the state. To say, I hear the sound, or the sound is heard by me, means ordinarily no more than to say, in a perfectly impersonal way: psychic fact of hearing has arisen in consciousness.

This somewhat too lively form of objection embodies a deserved criticism of a widely current psychological fallacy. I may, indeed, subsequently recall any psychic fact and attribute it to myself, as the state of which I *was* subject. I may also make this reference simultaneously, or nearly simultaneously, with the occurrence of such psychic fact. But I do not necessarily do this. To say that one can never *think* of a state of consciousness which is not some one's state of consciousness is, then, obvious enough. To say that *I* cannot remember a state of past-consciousness without implying that it was *my* state is scarcely less obvious. But to say that the terms of the very existence of every state of my consciousness are identical with the terms of its being thought about as consciousness, or even with the terms of its being recognized as referable to *me*, as *my* consciousness, is not at all obvious. In other words, phenomena of consciousness as such, in this use of the term, do not necessarily involve that reference of state to *Self*, as its subject or ground, in which the essence of developed self-knowledge consists.

But psychic facts, or phenomena of consciousness, in order to serve as data of psychology, must become objects of knowledge. That is to say, the phenomena must not only in fact exist, but they must also be known to exist; in this respect psychology does not differ from every other empirical science. But psychology is peculiar, and indeed unique, in that the relation between the occurrence of the phenomenon, as fact, and the observation of its occurrence is different from that which accompanies the attempt to acquire data in any other science. Observation is itself a phenomenon of consciousness; and when this observation is direct, it is separable, neither in reality nor in time, from the phenomenon observed as a fact. This is equally true whether the observation is deliberately conducted for purposes of definite self-knowledge, or resembles those faintest glimpses of psychic facts which most of our ordinary so-called "inner illumination" reveals. In these respects all psychic facts are alike in the way in which they become immediate objects of knowledge. In these respects the data of scientific psychology are identical with the knowledge which every plain man has of his own mental life. In all cases of immediate knowledge of a phenomenon of consciousness, the knowing of the phenomenon as object, and the phenomenon known as fact, is one state or complex phenomenon of consciousness. In general, there are not two parallel or rapidly succeeding series, or orders, of phenomena to take

account of; there is only one and the same phenomenon (complex and shifting, although "one and the same"), which, in one aspect, is phenomenon *for* consciousness, and, in another aspect, is phenomenon *of* some object. Not in the reality of the psychic fact, but by an abstraction to which no reality ever corresponds, two *momenta* can be distinguished—viz., the existence of the particular content, and its belonging to the collective content of my consciousness. Its existence *for me*—this *is* my consciousness of it.[1]

Further light is to be thrown on the nature of consciousness only by anticipating other truths, which will be fully discussed later on. Among such truths the following are most important: The so-called faculties are all exercised in every state of consciousness. To say the same thing in better accord with the fundamental facts of experience: every state of consciousness, or psychic fact, so far as it ever becomes an object of knowledge, is a complex state, a fact with several aspects or sides. It is fact of intellection, fact of feeling, fact of conation; and yet it is these, without ceasing to be one psychic state or fact, in the life of consciousness. But the most primary form of intellection is discriminating consciousness. In other words, within, and as an integral part of, every psychic fact, discriminating mental activity is involved. We may then say that every phenomenon of consciousness which becomes an object of immediate knowledge, is accompanied by conscious discernment of this phenomenon as such a fact, and no other, in the so-called flowing current of conscious life.

Attention is the necessary presupposition and unceasing accompaniment of all the life of consciousness. As many writers truly and yet figuratively say, attention may be variously "distributed" over the different parts of the area covered by each state of consciousness. It may become directed to the more perfect discrimination of this or of that aspect of any complex psychic fact; and as the direction of attention changes, or the intensity of attention becomes modified, the complexion of the psychic fact itself changes. Just so far as attention becomes directed to the content of consciousness, to the nature of the psychic fact, as such, and to the relation in which any particular fact stands to contiguous psychic facts, we have the basis laid for an important modification of the nature of consciousness. In such discriminating activity, and in its accompanying "self-feeling," and in accompanying motor activities, the foundations of self-consciousness are laid. In order, however, that self-con-

[1] Comp. Natorp. Einleitung in d. Psychologie, p. 62 f.

sciousness, more properly speaking, may be developed, a concept of the *Ego*, or "self," must be formed; and this is dependent upon the development of conceptual knowledge.

Discriminating consciousness, or, as it is sometimes called, "perceptive consciousness," is therefore necessary as the accompaniment of all psychic facts, if such facts are to become objects of knowledge, and so furnish data for scientific psychology. It is this truth which causes the confusion of consciousness as mere psychic fact and self-consciousness, and which gives rise to the theory that all conscious experience necessarily involves a knowledge of self. In accordance with this distinction, we may now modify our previous more vague conception of consciousness. In so far as *consciousness* can serve the purposes of self-knowledge it must be defined as *synonymous with psychical state, regarded as discriminated, however faintly, in respect of content, and related, however imperfectly, to the stream of mental life.*

§ 2. The difficulties that accompany the effort to tell how I can, in one and the same state of consciousness, not only have intellection, feeling, and will, but also know that I have them, largely arise from that fruitful source of psychological fallacies—the substitution of abstractions for actual experience, of *thoughts about* what can take place for *knowledge* of what actually does take place. The error is essentially the same, whether the possibility of all real self-consciousness is denied, or the impossibility of any fact of consciousness existing without activity of reflective self-consciousness is affirmed. The truth is that people generally suppose themselves to be capable of recognizing their mental experience as their own, and of attributing it to themselves, with an immediate and indubitable certainty. On the other hand, they do not believe that they always, or customarily, do this. A science true to facts amply justifies both these popular opinions as against the two corresponding forms of the psychologist's theoretical fallacies.

§ 3. The truth that a measure of self-consciousness is necessary in order that all psychic facts, as such, may become immediate objects of knowledge, gives us the key to that extraordinary divergence of view concerning the nature and value of consciousness which different treatises on psychology display. In the light of the foregoing truths, we may now profitably refer to the pregnant declarations of several authorities on this subject. Thus one writer[1] denies that the existence of "ideas" (here nearly or quite synonymous with psychic facts, regarded as discriminated and related to other facts) and consciousness are one and the *same* thing. There are psychical facts enough which are not perceived. But the same writer holds that to be perceived and to arise as an idea in consciousness are not different processes. Unconscious mental processes exist in great variety and abundance, but "unconscious idea" is a contradiction in terms. Another writer,[2] after affirm-

[1] Lipps: Grundthatsachen d. Seelenlebens, p. 90 f.

[2] Brentano (*So gebrauche ich ihn denn am Liebsten, etc.*): Psychologie, I., p. 182.

ing a decided preference for that use of the word, "consciousness," which identifies it with psychical phenomenon or psychical act, goes on to maintain: Every psychical act is conscious in that, however simple it may be, it has, besides the primary object, a secondary, viz., the psychical phenomenon itself. Hence, every psychical act may be considered in four ways: (1) As a mental image of the primary object; (2) as mental fact in itself; (3) as cognition of itself; (4) as feeling of itself. Still another writer[1] maintains that thinking and consciousness can be separated only ideally—that is, in thought. There is no thoughtless consciousness; for consciousness is always thinking consciousness. And yet this writer adds, "Thinking is consciousness brought to an orderly unity."

All the foregoing and similar views contain important truths. Their apparent contradictions with one another, and their obvious internal confusion, are removed when we remember that, although consciousness may properly be identified with all psychic facts as mere occurrences, psychic facts cannot be known as such, without involving at least inchoate and confused self-consciousness. The beginning of self-consciousness is consciousness considered no longer as bare psychic fact, but as discriminating its state and relating this particular state to others in the stream of conscious life.

§ 4. The course and laws of the development of self-consciousness can be more fully traced only after the phenomena of feeling, perception, and conceptual knowledge have been further considered. Consciousness—meaning self-consciousness—has always been closely related to perception. Thus we are told: "Consciousness is the condition in which we not only have the content of the idea in the soul, but also *percsive* or remark the same."[2] On the contrary, the necessity of distinguishing between consciousness and self-consciousness is made more clear by reflecting upon the difference between perception (by the senses) and self-consciousness. When I am observing an object through a microscope, or a fireman rescuing a woman from the window of a burning building, or am listening to an interesting political discourse, or to a sonata of Beethoven, I am in a high state of perceptive consciousness; but I am little, or not at all, self-conscious.

What has been said of discriminating consciousness illustrates, however, the truth of Dr. George's[3] remark: The possibility of self-consciousness depends upon the fact that the conscious *Ego* is, as it were, a "wandering point;" and that thus the entire process of perceiving objects is, in the last analysis, closely connected with a process of establishing their place and form in relation to the thinking subject and to one another. As the powers concerned in the perception of objects develop, so—but not in the same order or proportion, necessarily—does the so-called faculty of "inner perception," or self-consciousness, develop.[4]

What is meant by a "State of Consciousness" should by this time be tolerably clear. The very words imply, what all knowl-

[1] Horwicz: Psychologische Analysen, I., p. 164 f.
[2] Comp. Fortlage: Beiträge zur Psychologie, p. 156.
[3] Lehrbuch d. Psychologie, p. 403 f.
[4] Comp. Hartsen: Grundzüge d. Psychologie, p. 17 f. And Mohr (Grundlage, etc., p. 48) says: "We always connect the concept of perception with the word consciousness."

edge of mental life progressively illustrates and confirms, viz.: that we are here dealing with some sort of unity in variety. If there were no real *unity* implied, and experienced as it is implied, we could not speak of *a* state of consciousness; and, of course, if we could not speak of one such state, we could not speak of several different states, or compare state with state, or trace the genesis of any one state, or group of states, in relation to the entire development of mental life. But if the so-called single states of consciousness were not, in reality, also *complex* and capable of being actually known as complex, we could not distinguish one state as different in structure, or tone, from other states, could not classify states, or build up knowledge of the development of self.

This unity in variety, which belongs to all states of consciousness as such, is of unique character—and this, whether we lay emphasis on the unity that comprises the variety, or upon the variety comprised in the unity. Both the unity and the variety must be conceived of and described in such a way as fairly to represent the facts, and not to violate or discredit each other. The unity of each state of consciousness *is* such that it in no wise makes impossible a variety of content (and even a variety of self-recognized content) as belonging to that one state. But the variety also of the content of each state of consciousness *is* such that it, whether recognized or unrecognized, in no wise destroys or impairs the unity of that particular state. Nor must it be forgotten that we are here dealing with an actual concrete unity, such as may be known in experience, and with a similar variety in such unity, and not with the abstract unities of mathematicians or psychologists. Certain conceptions of unity and variety may be framed which make it unthinkable that a variety of content should be realized in one state of one subject—one mind to which the complex state belongs. But a state of consciousness *is* no such abstract unity devoid of real variety; nor is it an abstract diversity incapable of being united in a unity.

There is no other way to know what sort of a unity in variety every state of consciousness actually is than reflectively to observe some such state of consciousness. In this way it becomes clear that no state of consciousness can be known as single in the sense of being apart from the contiguous stream of mental life. But each state becomes known as *one* state in so far as discriminating consciousness separates it, however vaguely, from this stream; while the boundaries of separation are fixed only in and during the discriminating activity itself. Moreover, the different elements, factors, phases (the name is not so very impor-

tant here) of the one state exist, as component parts of that one state, only in and during this same discriminating activity. What and how many these elements are depends—we may say somewhat figuratively—upon the wandering of the point of attention and its distribution over the entire area, rather than upon the constitution of the state regarded as something made up outside of attentive and discriminating consciousness.

By a "state of consciousness" we mean, then, *such portion of the actual life of consciousness as may be, by discriminating activity of consciousness, considered as one, both with respect to its own so-called constitution, and also with respect to its relation to other states of the same life.*

§ 5. To illustrate further the unity in variety which every state of consciousness is, we may take an example. I am observing a horse, running at full speed; or I am reading an interesting discussion in a book. A friend interrupts me with the question: What are you thinking about? If I answer as fully as possible, I may say in the one case: I am thinking as I observe,—What speed, what grace of motion, what strength! I am feeling exhilaration at the sight of such speed, grace, strength. I am calculating whether the animal will make the goal by a given time, etc. Or I am thinking as I read: How true, or what nonsense! I am feeling repugnance toward the views of the writer, or sympathy with his skill in setting forth the truth. I am anticipating what the next turn to the discussion will probably be. By more careful analysis I may also recognize the truth that I am suffering certain dimly conscious bodily feelings of discomfort from the hardness of the seat, the bad air surrounding me, or the "leavings-over," as it were, of the news received in the morning that one of my investments has failed.

But it will be said that the state of consciousness which is thus described in answer to the question is itself not only another, but a quite different state of consciousness from that to which the question referred; it is indeed only a subsequent state of reflective consciousness by which the earlier state is remembered in an imperfect and perverted way; moreover, it is itself not *one* state, but a succession of states in the unceasing flow of mental life. And all this is, in some important meaning of the words, the truth. Two things must, however, be noted. Such memory-states are themselves true states of consciousness and have the unity in variety which belongs to all states of consciousness. Again, the transition from one state to another, even when the character of the consciousness changes markedly, as—for example—in answer to the above-mentioned questions, is never like a sudden leap from one form of mental life into a totally different form of such life. Factors of intellection, feeling, and conation, are carried over—so to speak—from one state into the next; these factors, thus carried over, bind the states into the unity of one mental life, while they do not prevent discriminating consciousness from considering portions of that life as ideally separable states.

§ 6. In this field of reflection, figures of speech are very powerful. With this in mind, we should avoid comparing consciousness to a line, or the different moments (and states) of consciousness to points in a line.

Neither is the comparison of states of consciousness to a compound resulting from a perpetually changing chemical synthesis free from all objection. All states of consciousness—as we shall soon see—actually occupy a somewhat indefinite but appreciable amount of time; this is true whether the time be measured by objective or by subjective standards. Moreover, the factors, or *momenta*, which enter into them are not entities that can be analyzed out of them and made to enter into other combinations, as can the atoms or molecules of a physical or chemical synthesis.

A series of circles, with widening or contracting areas, made by a curved line that keeps advancing while it constantly returns upon itself, so as to include in each new circle a part of the area belonging to the preceding circle, is a better mathematical figure than that of movement along a line, to illustrate the nature of consciousness. What goes on in the field of a not too rapidly revolving kaleidoscope may also be taken as an illustration. Or if the change of states is to be represented by a series like A, B, C, D, . . . Z; then, since $A = (a, b, c, d, e,$ etc.), $B = (c, d, e, f, g,$ etc.), $C = (e, f, g, h, i,$ etc.), $D = (g, h, i, j, k,$ etc.), etc., etc.; the true character of the change is better represented by a steady or somewhat intermittent flow of the following order: (a, b, c, d, e, etc.) into (c, d, e, f, g, etc.) into (e, f, g, h, i, etc.) into (g, h, i, j, k, etc.), etc., etc.

§ 7. The question whether we can properly speak of *unconscious* factors or modifications of mind, as combining to form states of consciousness, has been much debated. The argument of Leibnitz is well known: "I hear the noise of the sea, but I do not hear the noise of each wave alone; yet the noise of each wave must produce a mental effect, otherwise the whole together would produce no mental effect." So M. Taine[1] argues with regard to the nature of states of auditory consciousness; and Sir William Hamilton applies a similar argument to the constitution of the *minimum visibile*.

Now that the aggregate effect of a large number of minute physiological changes, no one of which alone would occasion a modification of consciousness, may be the production of a particular mental state, there can be no doubt. Experiment constantly shows this effect taking place. We may even be inclined to admit that unconscious but real psychic changes have an influence upon the character of all our states of consciousness. But to regard conscious states as compounded out of more elementary states of the unconscious, or to argue that because I have a conscious sensation produced by a certain number or intensity of nervous shocks, therefore I must have a certain, though unconscious, sensation produced by each component nervous shock, is quite unwarrantable.[2]

§ 8. It is, however, equally unwarrantable to press the so-called unity of consciousness so as to deny that each real state of consciousness is complex, or even that this complexity may be recognized by discriminating consciousness. While, then, we may say, with Professor James,[3] "Whatever things are thought in relation are thought from the outset in a unity, in a single pulse of subjectivity, a single psychosis, feeling, or state of mind," we must also note that this very sentence admits that *several* things may be

[1] De l'Intelligence (4th ed.), I., p. 175 f.

[2] See Rabier: Leçons, etc., I., p. 55 f., for a criticism of Taine's argument.

[3] Principles of Psychology, I., p. 278.

"thought in relation," and uses the word "feeling" to indicate an important phase of the one state differing from the thought which relates these things. Moreover, we shall see that, instead of the conscious state having from "the outset" all the unity it can attain, it may rather be said to develop such unity according as the variety of its content becomes discriminated more clearly.

The foregoing description of states of consciousness, as they become objects of knowledge, and so furnish immediate data for scientific psychology, justifies us in regarding each such state as equivalent to what may figuratively be called a "Field of Consciousness." Every field of consciousness may then be said to have a certain "circuit," inasmuch as it contains a larger or smaller number of discriminable factors or objects. It may also be said to have a certain "intensity," since we are much more alive psychically at some times than at others; and also a certain character or "tone," since the nature of the predominating form of mental life differs in different states of consciousness. For example, in illustration of the last distinction: sometimes the field of consciousness may be characterized as objective, for I am "occupied with," or "absorbed in," the perception of some natural object, as the movement of a frog-preparation under the stimulus of the electrical current, or the curve of reaction-time which is being marked upon a revolving drum. At other times I am "overwhelmed with" physical pain or "drowned in" sorrow, or "all alive with" expectation or joy. In other words, the field of consciousness is chiefly occupied with subjective feeling. Moreover, the different fields of consciousness, discriminable as such in the flow of mental life, succeed each other with varying degrees of rapidity. No fact is more familiar than this, that sometimes our thoughts come and go with an enjoyable or tantalizing speed; while at other times the flow of mental life is sluggish and we have relatively few states of consciousness within a given objective time.

Different "fields of consciousness" differ, then, as respects (1) extent, or "circuit"; (2) intensity, or amount of mental life entering into them; (3) speed of movement as measured by the number of recognizably different fields occurring in a definite amount of objective time; and (4) character, or predominating specific quality. The fuller discussion of each of these topics requires the previous treatment of several allied subjects; but upon each a few words of detail are now in place.

§ 9. The accurate experimental measurement of the *extent* of the field of consciousness is made difficult by the complication of this problem with many changing and obscure conditions. Among these the character and

distribution of the "attention" given to the different factors or objects in the one field is most important. The older form of speculative psychology maintained the impossibility of attending to more than one thing at a time, as a deduction from the unity of the soul. Strictly carried out, this theory leads to the conclusion that mental development cannot show itself in consciousness except in the way of increased speed in the succession of mental states. But modern evolutionary psychology recognizes the dependence of the field of consciousness, as respects both energy and variety of recognized content, not only upon the age and culture of the individual, but also upon the development of civilization. Here, as everywhere else, it invites us to return from merely speculative deductions to the actual facts of psychical life.

The number of successive impressions of sound, for example, which can be so far "grasped together" as to allow clear discernment of the likeness or unlikeness of that particular field to another field similarly constituted, has been experimentally investigated.[1] When the interval between the successive impressions was the most favorable possible (0.2–0.3 sec.), without *grouping* the impressions, 16 was found by one experimenter to be the maximum even number, 15 the maximum odd number, which could be united in one field of consciousness. It should be noted, however, that in such experiments attention is uniformly distributed and a certain "sensation-mass," as it were, is the only clearly discerned object of perception, while the individual factors in that mass are but dimly distinguished. Now a distinction must be made between the extent of the field of perceptive consciousness and the extent of what has been called "apperception" (or *clear discrimination of particulars*) within that field. And Professor Cattell[2] has shown that four or five visual impressions exhaust our power of clear discernment. This experimenter tested the "grasp of consciousness" by displaying from 4 to 15 short perpendicular lines for 0.01 sec. Of eight persons experimented with, two could give correctly the number seen up to 6, but none beyond 6; three others up to 4; and three persons could not be sure of even so many as 4. It is interesting to note how these conclusions agree with those of Hamilton, who affirmed that the field of his visual consciousness could embrace 6 or 7 distinct simultaneous impressions. Yet more recent experiments[3] show that if more than 5 or 6 (or in "exceptional and star records," 8) tactual impressions occur simultaneously, they cannot be localized in the one field of consciousness; the surplus number drop entirely out of the field or fuse in their resultant with other simultaneous impressions. And returning to impressions of sound: our ability to recognize a difference of one click does "not extend far beyond groups of 8 or 10 clicks."[4]

The dependence of the extent of the field of consciousness, whether dimly and almost blindly perceptive or clearly apperceptive, upon natural and acquired characteristics—upon heredity, age, training, bodily condition, etc.—may be experimentally confirmed. To this end the various "tests"

[1] By Dietze and others. See Ladd: Elements of Physiological Psychology, p. 494 f., and Philosoph. Studien, ii., Heft 3, p. 362 f.

[2] Philosoph. Studien, iii., Heft 1, pp. 94–127.

[3] By Dr. Krohn: Journal of Nervous and Mental Disease, March, 1893.

[4] Minor Studies from the Psychological Laboratory of Clark University, i.

for school-children and others, with a view to determine how many objects they can grasp together in one mental activity, so as to remember and describe them, are of scientific as well as practical value. Of value in both directions, and closely connected with the whole development of mental life, as memory, knowledge, and will, is the fact that growth of speed and skill in rational mental synthesis enlarges the grasp of consciousness. Thus, as experiment shows, groups of letters are harder to grasp than groups of figures; only half as many disconnected as connected words can be united in one field; only one-third as many disconnected letters as letters connected in words. These results are partly due to the influence of habit; but they also indicate *the dependence of enlarging perceptive powers upon the synthesis of thought.*

The actual limitation of the field of consciousness, with respect to extent, is a source both of mental strength and of mental weakness. That we *can* grasp together, and yet discriminate so many items in one conscious state, is an exhibition of mental strength. It is even possible to conduct side by side, as it were, two quite distinctly different psychical life-currents, and yet do this in the unity of one consciousness. Many have had an experience like that of David Copperfield, as he wandered through the streets of London, stupefied with grief and reflecting upon his grief, and yet all the while noticing the minutest details of the objects surrounding him. Frederick the Great is said to have boasted of his father, Frederick William First, that he died observing himself, in death, as a scientific investigator observes a natural phenomenon.

§ 10. The Herbartian school has doubtless thrown much light on the formation of the different fields of consciousness by its theories of the grouping together, under the "eye of consciousness," as it were, of the contemporaneous "ideas." These ideas this school seems to teach, sometimes form a field of "flat surface," in case none of them attracts attention to itself in higher degree than do the others. But if one or more of the ideas, or groups of ideas, attract more attention than the rest, the so-called field of consciousness exhibits inequality: hills and intervening valleys, or finally, a towering mountain, may occupy nearly the entire field. We object seriously to the Herbartian theory, in that it seems to make entities out of "ideas," to confuse the boundaries between consciousness and the unconscious, and to set up untenable mathematical formulas for the "fusion" and separation of the so-called factors of mental life. But the following truth is illustrated by all our study of psychology:

Every state of consciousness, in developed mental life, must be regarded as resulting from an immense number of living factors that form a sort of organic unity.

§ 11. That different "fields of consciousness" differ in *amount of psychic energy*, in some recognizable way, is an indubitable fact of experience. Of all of us it is true, our experience in consciousness is more vivid, more intense, by far, at some times than at others. What is meant by this is particularly clear when we apply such language to our states of feeling. We speak of pains as *more* or *less*, and of pleasures as *great, moderate*, or *small*. That sensations have quantity, which is indirectly measurable, and how it is that "Fechner's law" attempts to formulate this fact, will be explained in

the proper place. And in spite of all which Lotze and others have urged to the contrary, we think the common impression, that "ideas"—meaning by this both memory-images and images of the imagination—differ in vividness and intensity, is scientifically justifiable. "Intensity" is, moreover, a word which we find peculiarly appropriate to describe a certain kind of difference recognized when we compare our desires and states of conative, or striving, consciousness with one another; what can be meant by thoughts differing in intensity is, indeed, more difficult to explain. But, plainly, those convictions, confidences, hopes, fears, expectations, etc., which make so necessary a part of all our states of judgment, differ in intensity.

On the basis of such experiences we form the conception of consciousness as admitting of an indefinite number of degrees of energy. Between any two states of consciousness, *A* and *C*, differing from each other in amount of mental life, we can imagine that another, *B*, which shall be more intense than *A*, and less intense than *C*, may be interpolated. This picture of a continuous line, measuring the amount of psychic energy displayed in any given field of consciousness, has an indefinite further or upper end; this end marks the maximum of intensity. How much can I feel, without losing consciousness? How vivid can my memory-image or picture of imagination become as measuring the utmost capacity for vividness which my conscious mental life can display in this way? But at the inferior or downward-dipping end, the line of consciousness passes what is called "the threshold of consciousness." In other words, as respects intensity, the different fields of consciousness differ by minute gradations all the way from an indefinite maximum, which varies for the individual and for the nation and for the race, to that lowest degree which can just be distinguished from "the unconscious."

Is, then, the distinction between consciousness and "the unconscious" to be abolished? And if this distinction be abolished, what becomes of the very basis for the knowledge of truly *psychical* life? The answer to this inquiry requires a knowledge of developed mental experiences, and even involves no small temptation to resort to metaphysical assumption. But we now need to remember simply: it is not as respects intensity alone that conscious states differ from each other, and that all conscious states differ from "the unconscious;" but only as objects of discriminating consciousness, and therefore as not of too great or of too little intensity, can different fields of consciousness be compared. Further discussion of this topic must be for the present postponed.

§ 12. The *speed* of the change or succession of different fields of consciousness is dependent upon the time which is required to form the single, so-called, fields; and this, in turn, depends upon the character of the field formed, and especially upon the amount of discriminating activity involved. The same result also depends upon inherited and acquired characteristics—temperament, habit, training, bodily and mental condition, etc. *A certain amount of time is required to form any field of consciousness, to "come to consciousness" at all*, as we are accustomed to say. This is true whether the particular field be described as the having of a sensation, the perceiving of an object, the remembering of a word, recalling an associated image, framing a thought, exercising a choice, or whatever form of activity be par-

ticularly characteristic of the "field." There is probably a certain amount of time which is, for every individual, most favorable for the formation of such a state of consciousness as shall be characterized by the greatest amount of content, vividness of realization, and clearness of discriminating energy. But the more elaborate any field of consciousness is, the more time is required, within given limits and other things being equal, for its formation. Fields of consciousness characterized by discriminating perception ("apperception") require more time for their formation than those which consist more nearly of mere sensation-mass; those characterized also by choice require yet more time.

There is certain evidence from experiments in reaction-time to show that about three-quarters of a second is the average time required for the formation of a not too complex state of fairly clear discriminating perceptive consciousness. Years ago (1868) Vierordt concluded that very small intervals of time are regularly overestimated and greater ones underestimated. The minimum of error in our sense of time he placed at 1–1.5 sec. Subsequent more careful investigations led others to conclude that our sensitiveness to time intervals is greatest for intervals of 0.7–0.8 sec. Yet more recent and accurate researches have shown how very complicated is even this seemingly simple problem; but they have on the whole tended to confirm this interval as about that of the average most accurate time-sense. It may, then, be taken as a fair measure of the time necessary to come to a state of discriminating consciousness, where the problem before consciousness, as it were, is an ordinarily difficult one.

Measuring in the same way, it is found that the period occupied in the development of the simpler forms of sensory-motor consciousness is somewhat shorter than that given above. In general, simple reaction-time—that is, the period between the action of some form of sensory stimulus upon the organ of sense and the motion of some member of the body to indicate that the resulting state of sensation is recognized as having taken place—is 0.1–0.3 sec. Many variations arise within these limits, depending upon the kind of sensation, the kind of motor reaction, the intensity of the stimulus, the fixation of attention, and various other conditions. For example, Goldscheider found [1] that temperature sensations come to consciousness later than those of contact, that cold is perceived much sooner than heat, and that the difference increases with the distance of the stimulus from the brain, until it may reach as much as 0.5 sec. With feebler degrees of stimulation the time occupied in coming to consciousness increases, while the accuracy of perception decreases (*i.e.*, the average errors and personal errors increase). But if clear discernment of the *significance* of the sensation-complexes takes place—and this involves, of course, more activity of so-called memory and judgment—still more time is required. Thus Baxt found that if a disk with letters on it be displayed and then quickly followed by displaying a bright white disk, when the interval between the two is about 5σ,[2] the first disk is seen as scarcely a trace of a weak glimmer; but at 9.6σ interval letters appear in the glimmer, one or two of which can be partially recognized at 14.4σ; four letters can be well recognized at 33.6σ; and six letters,

[1] Reactionszeiten d. Temperatur-Empfindungen. Berlin. Physiolog. Gesellsch., June, 1897.

[2] Here and elsewhere σ signifies thousandths of a second.

at 52.8σ. On the other hand, after much practice and with attention fully on the alert, sensation, perception, and "apperception" seem to fuse into one process—an *intuitive leap of discriminating consciousness*—in which intelligent choice, even, may have a part.

When reasoning from these experiments in reaction-time to determine the real time-rate of the growth of states of consciousness—the period actually occupied in the formation of the field of consciousness—two things must be remembered: First, this objective measurement does not exactly indicate the subjective growth; since the precise amount of time to be allotted to the physiological processes between the organ of sense and the brain, and between the brain and the muscular reaction, cannot be stated; nor do we certainly know how strictly parallel in time with the processes in the brain are the changes in consciousness. Again, all experiments of this kind are necessarily somewhat artificial in character, and so must be received with caution in proof of principles of the natural life of mind.

The time-rate of the life of consciousness, considered as involving the succession of one field of consciousness by another, is a subject the discussion of which is complicated with the development of memory, imagination, judgment, and indeed of the entire mental life. It cannot, therefore, be treated at this stage in our investigation. Certain general truths relating to this subject must, however, be constantly borne in mind: (1) The speed in development and in succession belonging to different series of psychical states is different for different classes of such states. (2) In general, the time-rate of the life of consciousness depends upon a vast and incalculable number of factors; yet it has its maximum and its minimum. (3) Different persons, under different circumstances, are either "fast," or "moderate," or "slow," in mental movement; but no one can be more than about so fast, or about so slow, since the time-conditions of all mental life have their limits fixed on both sides.

The three classes of difference which distinguish all fields of consciousness—Extent, Intensity, and Time-rate—are related to each other in a very interesting but puzzling way. Analogies derived from the physical, or even the purely biological sciences respecting the dependence of one "function" on another, however suggestive of truth they may be when rightly interpreted, are likely to be applied to psychical phenomena in a misleading way. In all expenditure of psychical energy, time, intensity, and number of objects over which the aggregate of disposable energy is distributed, are, indeed, related so that they may be conceived of as capable of statement in terms of mathematical formulas. No one can feel or think intensely without "consuming" more than a certain small amount of time; but no one can feel or think intensely for more than about so much time. No one can discern clearly any external object, or analyze any of his own mental states, without employing time in some proportion to the complexity of the thing to be analyzed and the clearness of the

resulting analysis. One can give *some* attention to several objects in one field of consciousness through a given amount of time; but no one can give nearly *all* his attention to more than one object, and this only for a given length of time. Furthermore, if we anticipate the ordinary division of psychical states between the three so-called faculties of mind—intellect, feeling, will—we may go on to say: No one can give himself up to thought largely without keeping clear from intense feeling and strenuous conation; no one can feel intensely (whether the feeling be bodily, æsthetical, or religious) without refraining, for the time, from minute analysis, etc.

On the basis of such experiences as the foregoing we might proceed to formulate the relations of extent, intensity, and time-rate, as belonging to all fields of consciousness, in imitation of the corresponding procedure of natural science. For example, the intensity of the "fields" varies inversely as their time-rate, within given limits; in any field the number of the objects to which the energy of discriminating consciousness is distributed varies inversely as the amount of energy distributed to any one, or more, of these objects, etc. Such statements would have a certain value; they might acquire a considerable amount of precision, especially as applied to certain of the simpler psychical processes, through the work of the psychological laboratory. They are of great practical importance in their bearing upon a wise economy of our psychical energy and resources. But, after all, when we look away to the larger fields of actual human life —and especially to those fields that lie in the higher ranges of such life—we see much which cannot easily be brought under such laboratory formulas. Abnormal or unusual mental states, rare moments in the experience of even men of average ability, the conscious intuitions and divinations of men of genius and of artists, suggest much which refuses to be thus formulated. How shall we measure that growth of mental life which consists both in deepening and in broadening, both in intenser feeling and in higher analytic skill, and not less in free and rational choice? How shall we state, in terms of mere number and quantity, the difference between the "fields of consciousness" in the life, on the one hand, of Aristotle and Kant, or of Shakespeare and Göthe, and, on the other hand, of the most degraded Bushman, of the hopeless idiot, or of "Peter von Hackländer," the soldier, who could never remember at one time more than two of the three ingredients of gunpowder? [1]

[1] See Lazarus: Das Leben d. Seele, ii., p. 241 f.

§ 13. Differences in the *character* of different fields of consciousness depend upon the particular aspect, or phase, of psychical energy which is emphasized in each of them. Thus we speak of ourselves as being, at one time, in a state of thought; at another time, in a state of feeling; at still another time, as making a choice, or "putting forth" an effort to move a weight or to remember a date. Such characterizations will be at once recognized as corresponding, in a general way, to the ordinary division of the soul into three faculties of cognition, feeling, will. Further subdivisions of more specific character in the fields of consciousness are based upon more minute analysis. Thus we speak of ourselves as "buried in" reverie, "plunged in" abstract thought, "lost in" sweet or painful reminiscences; while at other times our states are described as states of anger, fright, joy, etc. Again, we express the content of consciousness by speaking of ourselves as "swept" with storms of passionate desire. "carried away" by appetite, "driven by" impulse; or, yet again, we find ourselves raised to "serene heights" of religious contemplation.

It will be shown in due time that all the three so-called fundamental faculties are involved in every field of consciousness, that the distinction between active and passive consciousness is one only of degrees, and that all forms of intellectual life are necessary to every act of knowledge, whether of things by perception or of self by self-consciousness. Meanwhile the following truth of daily experience must be borne in mind: *Fields of consciousness are known actually to differ in character, inasmuch as discriminating consciousness discerns different degrees of emphasis exhibited at different times with respect to the differing phases or aspects of the one mental life.*

The Conditions of Consciousness are either physical or psychical. But in saying this we cannot, without metaphysical theory, absorb the one set of conditions in the other, or point out the *real* nature of the relations existing between the two sets of conditions. Psychology, as a descriptive and explanatory science, can only examine, in a very imperfect way, this question: On occasion of what phenomenal antecedents (whether psychical or physical) are definite effects in consciousness known to follow?

The existence and activity of the human Nervous System is the general physical condition of all those mental states which can become data for psychological science. In the threefold arrangement of organs which characterizes this system—(1) end-organs, (2) connecting nerve-tracts, (3) central organs—it is the end-organs of sense, and especially the central organs of the cerebral hemispheres, upon whose activity the states of consciousness chiefly depend. Moreover, we get sure proof of discriminative consciousness only on condition that the brain is supplied with properly aërated arterial blood. To stop this supply by cloture of the great arteries extinguishes all observ-

able phenomena of consciousness; psychic facts are not known to occur until the arterial circulation is re-established. Corruption of this circulation with drugs or products of diseased tissue alters, more or less promptly and profoundly, the character, extent, intensity, and time-rate of the fields of consciousness. All consciousness apparently involves a certain heightening of molecular activity in the brain-centers, and the consequent conversion of stored energy into kinetic energy—the destruction of tissue by the throwing down of molecules from a state of highly elaborate combination with unstable equilibrium to a state of less elaborate combination with more stable equilibrium. Thus there seems reason to maintain[1] that the physical basis of consciousness is to be thought of as coming under the general biological law: *All activity of tissue is conditioned upon its being decomposed, and then immediately regenerated by nourishment. Intensity of consciousness depends upon intensity of neural function; the latter depends upon intensity of the work of decomposition, and is inversely as the ease and rapidity with which the inner work of one nerve-element is transmitted to another.*

§ 14. The science of the phenomena of consciousness, as such, is not dependent upon our being able to decide whether a nervous system, or indeed any material organism, is an indispensable condition of all consciousness. It is only, for example, by remote and complicated processes of inference that we can (doubtfully at best) determine whether the spinal cord of a decapitated frog—or, for that matter, an amœba—is "conscious" or not. And when Professor Huxley and others incline to affirm that even our highest human consciousness is but an "epiphenomenon," rather than an influential fact in the world of reality, they are, at best, announcing a doubtful conclusion in the metaphysics of physics. But whether psychic facts, that can never be known by any discriminating consciousness as facts, occur or not, the conditions and character of our self-known psychic facts remain the same. And for scientific psychology to speak of the very phenomena, upon immediate knowledge of which it must rely, as "epiphenomena" (phenomena over and above the only real and scientifically knowable phenomena), is prematurely to abandon the only ground on which this particular science has legitimate work to accomplish.

§ 15. The connection of consciousness, or of psychic facts as known, with changes in the circulation of blood in the brain, is exceedingly intimate. But the precise nature of such changes is thus far undetermined. A recent writer,[2] presents reasons for believing that the physical condition of consciousness, as distinguished from the unconsciousness of profound slumber, is due to an excess of the pressure of the arterial circulation in the brain over the pressure of the venous circulation in the *pia mater*.

[1] See Herzen: Die physischen Bedingungen d. Bewusstseins, 1886.

[2] Dr. James Cappie: The Causation of Sleep. Edinburgh, 1889. And The Intracranial Circulation. Edinburgh, 1890.

Modern physiological psychology emphasizes the wonderfully delicate way in which the whole nervous mass responds to the slightest phases of change in all forms of excitation with accompanying modifications of even the lowest possible phases of conscious mental life. Haller, for example, noticed that the noise from beating a drum increased the flow of blood from an open vein. Mosso observed that the approach of a lamp toward a patient whose brain was exposed increased the volume of the brain-substance. M. Payot claims to have seen the passage of a cloud over the sun increase the respiratory rhythm and pulse-rate of a sleeping infant. M. Féré found that slight sensations of sound and smell sometimes affect a man's dynamometric force. Schiff and Vulpian have observed the pupils of the eyes dilate under the influence of various forms of excitement. Experiments in reaction-time show that increasing the intensity of conscious states of sensation increases the volume of the blood in the forearm and hand with which the agent is reacting.

Furthermore, the intensity and duration of molecular activity and the destruction of tissue in the brain are, in some sort, a measure of the intensity and duration of certain states of consciousness. Especially is this obviously true of emotional states. Such states exhaust themselves quickly, and leave an exhausted brain. Experiments seem to prove that those changes of temperature of the brain-mass which may fairly be supposed to indicate molecular activity are greater and more rapid in the development of those fields of consciousness which are characterized by strong emotion.[1]

The psychical conditions of consciousness are chiefly those very forms of psychical life which have already been indicated as present in all the various states of consciousness. Especially important among them is the "wandering" of discriminating, attentive activity from one object, factor, or phase, to another, within the entire so-called field of consciousness. And if we should say that the existence of a "mind" is the one precondition of all human consciousness we should perhaps be not much more premature in our metaphysics than are those who affirm that the brain is such a necessary precondition.

[Among the books referred to in the notes, Horwicz (especially the sections, Die Empfindungen und das Bewusstsein, i., Absch. 4; and Organik des Denkens, ii., Buch 4), Lipps (on Die allgemeinsten Thatsachen, Absch. 2), and Lazarus (iii., 1, Der Tact) are most suggestive on the general subject. See also Wundt: Physiolog. Psychologie (2d ed.), II., iv., chap. 15. Brentano: ii., chap. 2. Sully: The Human Mind, I., p. 72 f. Ochorowitz (Bedingungen d. Bewusstwerdens, 1874) gives a bibliography up to date, fairly full. Since then special monographs by J. C. Fischer, J. L. A. Koch, Schuster, Wahle, and others have appeared.]

[1] See Experimental Researches on the Temperature of the Head. Proceedings of Royal Soc. London, 1878. And comp. Tanzi: Centrl-bl. für Physiologie, Mai, 1888.

CHAPTER IV.

THE SO-CALLED "MENTAL FACULTIES"

It is presupposed, in the very attempt at a science of psychology, that different states or "fields" of consciousness can be surely discriminated as respects their intensity, extent, or number of discernible factors and objects, and characteristic quality. It follows, then, that a scientific classification of these states may be based upon their differences as actually known in the life of consciousness. In other words, psychic facts may be compared, "sorted out," and theoretically assigned to classes, on the basis of immediate observation. In the very attempt to do this, however, we become aware that there is much which is so peculiar about these facts as to modify our conception of the meaning and value of our work of classification. For, in the first place, the different factors and characteristics, by recognition of which we classify, have no existence apart from the individual states in which they are observed; and the states in which the factors and characteristics are discriminated do not exist apart from that conscious mental life which they, taken together, constitute. In the next place, the very tokens *by* which we compare and classify the states of consciousness do not exist, either in reality or in the conception we are able to frame of them, apart from the process of observation which notes them. Both these points have already, for the present, been made sufficiently clear.

These just-mentioned truths of all mental life are complicated with others of which account must be taken before we can understand the meaning and value of any classification of mental faculty. *All classification of psychic facts as immediately known is accompanied by an implied or express assignment of them to the same subject of them all.* In other words, I can, on the basis of immediate knowledge, only classify *my* states of consciousness as like or unlike other states of *my own;* you can, in the same way, only classify states of *your* consciousness as like or unlike other states of *your own*, etc. Thus all my conceptions of mental faculty are, in the last analysis, derived from experience with my own different modes of behavior as discriminated by my own

self-consciousness. To be sure, both you and I endeavor to improve and enlarge our knowledge of mental faculties in general by appeal to the widest possible realm of psychic facts. But, after all, this can only be done by a returning appeal to the immediately recognized differences in our own psychical life. By sensation, memory, and intelligence, or by love, hope, and fear, or by desire, striving, and choice, etc., we can only understand, in others, the possession and exercise of such so-called "faculties" as *we* know *ourselves* to possess and exercise. To speak of mental faculties—their existence, operations, laws, products, etc.—is, at bottom, a rather mythological way of saying: I know (by memory and self-consciousness) that my mental life assumes a variety of recurrent forms, more or less like or unlike to each other; and I know (by inference from observed physical signs) that the mental life of others assumes a similar variety of the same recurrent forms.

A semi-mythological way of speaking, similar to that just indicated, is common enough in all forms of science. For man, as a rational and metaphysical being, seems bound to explain the world of his immediate experience by referring it to a world of entities and relations that can never become objects of immediate experience. The modern physical sciences can never succeed in freeing themselves from such metaphysics. We have already noted the fact that self-consciousness assumes the *existence* (in some meaning of the word "existence") of a subject (a *self*) to which all states of consciousness must be referred. What more natural, and even inevitable, then, than that the various principal modes of the behavior of this subject should be spoken of as its "faculties," "capacities," "functions," "powers."[1] The language of common life, in which we always find the embodiment of genuine psychological truth, certainly indicates the permissibility of doing this. Suppose, for example, that my present experience claims to represent my experience in viewing a beautiful landscape one year ago to-day. I might express this complex psychic fact by saying either: "*I* distinctly remember that *I* saw Fuji (or the Matterhorn) at such a time in my life;" or, "My *memory* informs *me* of the fact that I saw, etc." And in the effort to emphasize the purely scientific interest (the "objectivity," so to speak) which I wish to give to the phenomenon of my memory, as such, I might even resort to some unnatural form of impersonal expression like this: "Psychic fact is now occurring which is recognitive (and so a fact of

[1] That even scholastic psychology did not mean by the doctrine of faculties to deny the unity and indivisibility of the principle of thought, see Hamilton: Lectures on Metaphysics, xx.

conscious memory) of another psychic fact considered as antecedent (fact of perception by the senses)." Now, if we ask ourselves whether these three forms of expression mean essentially the same thing, we are led to make the following distinctions: The first two mean something different from the last, and the difference is, both for science and for life, of inestimable importance. The first two mean at least thus much, *that self-conscious discrimination lies at the basis of all classification and explanation of the phenomena of consciousness.* But does the second of the three modes of expressing the fact of recollection mean anything essentially different from the first? In answer to this question we must say the difference is only a matter of possible convenience. The second form lays more emphasis on the truth that those psychic facts, which must all be referred to the same subject, differ in kind, and may accordingly be assigned to certain fundamental or derivative classes; but, in all important respects, the same truth is expressed in the first two forms of statement.

By the so-called "faculties" of mind, therefore, scientific psychology can, at most, only mean to indicate *the different modes of behavior, or forms of functioning, which discriminating consciousness assigns to the one subject of all psychical states.* In so far as this word or other cognate terms (such as "capacity," "power," etc.) can be safely used in the clear light of this understanding, we need not greatly object to them. But they afford no explanation of psychic facts, whether in general or in special; they are rather themselves the result of imperfect classification and confused analysis. Moreover, they lend little help to improved classification. On the other hand, their use, however guarded, is likely to occasion the separation in theory of that which is indissolubly and necessarily related in fact, the substitution of mere classification for real explanation, and a generally inadequate and misleading account of the development of mental life. At the same time, after uttering proper warnings, the limitations and necessities of psychological language are such that we are obliged to employ the terms assigned customarily to the so-called "faculties."

§ 1. The so-called "old psychology" has been accused, not altogether unjustly, of making an exaggerated and deceptive use of *classification* in the construction of psychological science. Much of its theory seemed to imply that when we have grouped the different psychic facts and have assigned them to different "faculties," we have satisfied the demands "of science." But what we wish to know is not simply under how many and what different classes the phenomena of consciousness may be arranged, but also, and chiefly, how to explain each form of activity, as arising out of other forms,

and as determined by the place which all mental life occupies in the natural environment of that life. In other words, we wish to connect psychic facts with other psychic facts, and with non-mental or physical facts, under uniform relations, so as to discover the so-called "laws of mental life."

On the other hand, it must be admitted that classification, even if the language employed to designate its results be somewhat misleading, is the necessary beginning of psychological as of every other science. Many of the classifications of the older psychologists are still of great assistance in the study of mental life. Moreover, it is not by any means wholly true that the effort at successful explanation is the mark of the so-called "new psychology" alone. Modern research is, however, distinguished: (1) by more careful experimental analysis; (2) by extending the range of induction to various fields of neglected facts; (3) by requiring a larger compliance with the principles of all scientific induction; and, especially, (4) by making constant use of the conception of development.

§ 2. The history of psychological science shows that modern opposition to the doctrine of "faculties" has developed chiefly along two lines. The first of these is that followed by the anatomical and physiological explanation of mental life. This opposition, in its extreme form, becomes a proposal to institute a "psychology without a soul." On the other hand, Herbart and the followers of the Herbartian movement, while admitting the existence of the soul as a reality and making use of this admission as an *explanatory* principle of all mental phenomena, reject the entire doctrine of faculties. Herbart himself did this in the interests both of a metaphysical doctrine of the soul's unity and also of a scientific account of its different functions. All the functions of the soul were reduced by him to one simple type, namely, that of "ideation" (called *Vorstellung*, and standing for all intellectual operations, both presentative and representative), in the most general sense of this word. The one thing which the soul does in response to all forms of relation between it and other beings is to put forth "ideas." Feeling and will, so-called, are, according to Herbart, secondary and derived activities of the soul, resulting, in all cases, from the relations developed between the ideating processes.

The searching analysis of the Herbartian school, the yet more searching analysis of the sensory-motor activities by experimental psychology, the study of psychic facts in the light of the conception of development, and the general effort of science to throw off unnecessary metaphysical assumptions, have combined either to discredit or greatly to modify the earlier doctrine of mental faculties. In what meaning we understand and shall use (if at all) this term, or any kindred term, has already been sufficiently explained.

§ 3. It is sometimes said—and not without a certain show of reason—that just as physical science has the right to talk of different classes of motor facts *as though* they were due to different real modes of one force, so psychology has the right to use terms which imply that the different psychic facts are due to different real modes of the activity of one force, or being, called "the mind" (or "soul"). But the case of physical science and that of psychology, though similar in some respects, are by no means the same. For psychology is less helped than is physical science by such semi-mythological language; on the other hand, it is much more likely to be misled or

seriously injured. Whether physics, for example, discusses the relations between electrical phenomena and temperature phenomena in terms of different "modes of motion," or as different "forms of energy," or even speaks of the two as though they were manifestations of different "entities," it is always consciously and definitely at work upon one and the same thing. As science it attempts simply to point out and state in mathematical formulas the definite relations which exist between observed changes of one sort and observed changes of another sort. In carrying out this attempt it is able to consider apart, as actually separable in their objective presentation, the compared classes of facts. Temperature changes it can measure apart by one set of standards (thermometers, etc.), and electrical changes, apart, by another set of standards (electrometers of one form or another). It can also compare both these classes of facts with other facts of change, by way of observed physical motion, and bring them all under one principle—the hypothesis of the conservation and correlation of energy. How the fundamental nature of psychic facts renders much of this impossible has already been repeatedly explained.

There can be little doubt that psychology has suffered from the improper use of the doctrine of faculties. It will be shown later on that this is still especially true of the entire view taken of the nature of *knowledge;* for "knowledge" is almost uniformly assigned, even by the more modern writers on psychology, to the place of one of the three elementary and indivisible faculties of mind. Mental faculties are—we are almost uniformly told—knowledge, first, and then feeling and will. But, in fact, knowledge involves a complex and continuous development of all the faculties; it is as truly a matter of feeling and will as of intellect. Many other examples of the same misleading effect might be taken from the history of psychology.[1]

The first impression when we enter upon the general field of psychic facts, for the purpose of classifying them, is one of bewildering variety. Certain main differences in the characteristics of the different fields of our own consciousness are, indeed, easily made apparent. But of minor differences we find so great and indefinite a number as to seem to baffle all preliminary attempts at classification. Moreover, in the interests of scientific exactness we at once ask ourselves: What principles of classification shall we adopt? To this latter question the most obvious answer is that given by the language of common life. This language sets forth, of course, the more strongly marked and unmistakable differences in our different psychic facts. For example, in the entire domain covered by the different fields of sense-consciousness we find that the established classifications depend upon the bodily organ whose activity mainly determines the character of the separable fields. Popular esteem recognizes

[1] On the defects of the ordinary doctrine of Faculties, see: Lotze: Microcosmus, bk. ii., chap. 2. Lewes: Study of Psychology, p. 27 f. Wundt: Physiolog. Psychologie, Einl. And, especially Herbart: Psychologie, Einl. And Beneke: Pragmatische Psychologie, Einl. and chap. 1.

five organs of sense, and five corresponding classes of sensations, or classes of fields of consciousness mainly of a sensuous character. But only a slight examination is required to show, for example, that tastes and smells are blended in most of our knowledge of substances taken into the mouth; indeed, a variety of other sensations—tactual, muscular, of temperature, etc.—blend with all our so-called "taste" of things. Again, if we try to classify sensations of smell, we find ourselves speaking of the smell *of* a rose, the smell *of* asafœtida, the smell *of* this or that substance. But this is not, properly speaking, a classification directly of our psychic states at all, but only of certain objects that are known or inferred to excite in us these differing states of sensation.

Indeed, the moment we reflect upon the principle which controls the most obvious classifications of even our sense-experience, we begin to doubt whether we have really been comparing at all "the fields of consciousness, as such," in order to discover their likenesses and their differences. The ground of this doubt is laid in the truth that it is the *objects* known by developed experience through the senses, and the *organs* known to be instrumental in acquiring an acquaintance with these objects, which are of first practical interest to us. Our "*states*, as such," do not concern us until reflective consciousness begins. But when we do turn discriminating consciousness upon the fields of experience, with the purpose of classifying its phenomena, this doubt immediately arises, and then continues to assume larger and larger dimensions. To choose an example from the fields of consciousness occasioned by irritation of the skin: by placing my hand upon a marble table I know the object to be smooth, cold, hard, flat, etc. All this knowledge I may be said to acquire through "feeling" of the table with my hand. But blue is not so unlike red, nor the smell of the rose so unlike that of asafœtida, considered as a phenomenon of consciousness, as is the smooth feeling of the table unlike its cold feeling; neither is its smooth feeling the same as, or strictly similar to, its hard feeling. Furthermore, red is undoubtedly unlike blue in that it is a different color; but it is like blue and unlike the feeling of cold in that red and blue are both sensations of color; while cold and heat are alike in that both are sensations of temperature. And yet cold and heat are in *psychical* quality so unlike that there is not the slightest difficulty in conceiving of a being that should pass its entire existence miserably cold without so much as having the faintest conception of the nature of the sensation of warmth.

Our doubts and difficulties are still further increased when we try to consider in what respects our memory-images are *like*,

in what respects *unlike*, the perceptions from which we are accustomed to say they are "derived;" again, in what respects our so-called concepts resemble and differ from our memory-images; and yet, again, in what respects thinking is unlike imagining, and imagining is unlike remembering, and so on. In the interests of an enlarged study of mental life, by the improved classification and explanation of all its phenomena, we may go on scientifically to investigate such questions as follows: In what respects is dream-life like and unlike waking life; the experience of the hypnotic subject or of the insane like and unlike that of the normal and sound consciousness; the animal or the savage or the infant like and unlike the adult and cultured man?

It is by no means with the wanton desire to create confusions, for the mere purpose of clearing them up subsequently, that we have raised such inquiries as the foregoing. Such confusions arise the moment we ask a question like the following: In what essential respect as phenomena of consciousness, in what purely internal qualities, do my sensations of blue and red resemble each other? Indeed, do we not meet with the color-blind who may have one of these classes of color-sensations without the slightest conception of the other? And if one think it easy to say just how the sensation of cold *quoad* sensation is worthy to be classed with the sensation of a musical sound, one only needs the effort to describe this internal resemblance to destroy his easy-going confidence. To push the matter to its extreme, we may say, classification of the psychic facts, on the basis of their internal resemblance to each other, their *strict* likeness as *psychic* facts, seems to be difficult, if not impossible. This truth is at present admitted by all with respect to sensations of smell. But is not the case, we may ask, essentially the same with all kinds of sensations, and indeed with all kinds of elementary psychic facts?

Three considerations sum up what is necessary to be said upon the classification of mental phenomena at the present point. First: what all the sensations and more primary forms of feeling and desire are *like*, and what *unlike*, can only be known by a real experience extending to each one of them. To the totally blind man we cannot describe what sensations of color are like by bidding him dwell upon sensations of sound; and of the deaf man the reverse is true. The man blind to the color red cannot know what red is really like by study of his own sensations of blue; the tone-deaf man cannot know what a musical scale is like by being directed to consider his own sensations of noise. We might even say that the man who has had experience

of the peculiar quality of the note a^1 cannot know in what respect the "sharp" or "flat" of this note is like or unlike the note a^1 itself, except by mentally, at least, executing the required slight change of pitch and marking the modification of his own consciousness. Confessedly, no one, by tasting sweet alone, can know the nature of the sour or of the bitter; nor, by smelling camphor, can one tell how heliotropes smell. The same thing is true of the more elementary forms of feeling. What they are like can be known only by their being felt.

Second: We actually classify our states of consciousness by selecting some one or more of their most prominent characteristics and roughly comparing them with other states in which the same characteristics have also been prominent. What we mean by "same characteristics" here is ordinarily very complex. In the case of color-sensations, for example, we mean that certain muscular and tactual sensations connected with the eyeball are associated with every color, and that every color is localized, as a surface of some object related to other colored surfaces, in the field of the eye. That is to say, color-sensations are all alike in the similarity of their connections with other complex sensory and motor and intellectual states. But in itself considered, if we could so consider it, each color-sensation has its own peculiar, indescribable and incommunicable quality. Hence it is that we use, for the classification of the senses, terms taken from the symbolism of space relations. Musical tones, again, are considered as like or unlike, not only because of the likeness or unlikeness of the objects from which they proceed, or because they are all alike received through the ear, but also because they can be arranged, as near to or remote from each other, along a line called a scale. But this line itself indicates the connection which each tone has established with muscular and tactual sensations in the effort to sing it or to image it; and perhaps also with visual sensations in reading notes. Thus the symbol for likeness and unlikeness of colors is, as we shall see, a triangle with one side incomplete. While for tastes we appeal to connected and localized sensations of skin and muscle; or, for both tastes and smells, to the likeness or unlikeness of the objects habitually associated with them. Here again the same thing is true of the elementary forms of feeling. They are classifiable only by appeal to complex associations.

But, third: After recognizing the indefinitely great variety of unlike qualities belonging to our more elementary sensations and feelings, we are prepared to notice that the case of the other so-called "faculties" is markedly different. Representative images,

or ideas, differ among themselves chiefly as the original sensations or feelings from which they are said to be "derived" were different. But *as representative images* they seem divisible into two classes at most, viz., memory-images and images of the imagination. This distinction may itself be shown to be one largely, if not wholly, of degrees; so that it would not be meaningless to say that all representative images, as such, are alike. But this likeness consists chiefly in the relation which they sustain as "copies" to their so-called "originals." How many kinds of will, properly speaking, can be recognized? How many kinds of thinking, and how many kinds of desire, as such? Whether the answer to these questions is definitely certain or not, every one recognizes at once the truth that remembering, imagining, thinking, desiring, and willing have not the same bewildering and unclassifiable variety, considered as faculty, which sensations and feelings have. We are thus led to *the distinction between the great number of qualitatively unlike forms of receptivity, as it were, and the relatively few forms of organizing activity displayed in all mental states.* It is imagining, thinking, and voluntary direction of attention which reduces all this variety to unity, and thus organizes our otherwise disparate and unlike factors of psychical life. And this is only saying in another way that psychology recognizes these mental activities as at the basis of all classification, unifying, and organization of what is otherwise discrete.

Finally, we may inquire as to the meaning and value of the ordinary threefold classification of so-called "mental faculties." There are customarily said to be three, and only three, underived and irreducible faculties of mind; these are Knowledge, Feeling, Will. Is this—which is now often called the "accepted"—classification of mental faculty scientifically justifiable? In answer to this question, it has already been said that "Knowledge," in any proper sense of that term, cannot be correlated with feeling and conation as a like elementary and original form of mental life. Much the same thing must be said of Will: it cannot be considered as an elementary and underived form of mental life. Moreover, all question as to the threefold division of the faculties of mind means, for descriptive and explanatory psychological science, just this and nothing more: Does that subject to which self-consciousness assigns the psychic states actually exercise three elementary and underived forms of function? By "elementary" forms of function we mean such as can be said to belong to every most simple psychic state, so far as such state can be made the object of discriminating conscious-

ness. By "underived" forms of function we mean such as cannot be described or explained in terms that have the same meaning when applied to other forms of function. When psychological science has reached these elementary and underived functions, its analysis and classification can go no further. The place to cease attempts at classification has been found.

But if the question just raised be properly stated and explained, it must be answered in the affirmative. *Every real psychic fact is complex with an irreducible threefold complexity;* it may be said to have three "aspects": *it is fact of intellection, fact of feeling, fact of conation.* To use popular language, which must be explained with care in order not to be deceptive: Whenever I know myself as *in* any state of consciousness, I know myself as perceiving or thinking something, feeling somehow, and doing somewhat. Whenever I infer any state of consciousness in another mind, I believe that other to be perceiving or thinking something, feeling somehow, and doing somewhat. One of these three "aspects" may be emphasized, as it were, at the expense of the others; but no one of the three can be destroyed without destroying the psychic fact itself as an object of discriminating consciousness.

Further, neither discriminating self-consciousness nor the highest flight of imagination enables me to do away with the difference between the three "aspects" of the one psychic fact. Each of the three, as such, and psychically considered, is peculiar in quality, unique, not to be confused with the others, or expressed in terms of the others. Intellection cannot be described in terms of feeling; neither can conation. To know what feeling is, the feeling—and, as we have already seen, the peculiar feeling—must be *felt.* The same thing is true of conation. That complex states of consciousness, which are predominatingly states of feeling, follow in dependence upon other complex states which are predominatingly states of intellection, and that the former are in their turn followed by states of will, is matter of common enough experience. I learn that my friend is dead; I feel sorrow, and desire to pay respect to his memory; and I resolve to attend the funeral. Or I hear that a chamber concert of classical music is to be given; I have feelings of pleasant recollection and anticipation; and I decide to purchase tickets. Such examples are given to show that knowledge *excites* feeling, and feeling furnishes *motive* to will. But, in the same abstract way of speaking, it is equally true that will represses or excites feeling, and feeling modifies knowledge, etc.

The scheme of classification suggested by our discussion will

lead us to study *all the so-called faculties as resulting from the development of mental life by the combination and elaboration of the simpler and more elementary psychical activities.*

§ 4. The threefold division of the mental faculties was first established by the authority of Kant.[1] It was soon widely adopted in Germany, and has, more lately, been prevalent in other lands. The scholastic division into powers of Understanding and powers of Will was for a considerable time almost universally adopted by English-speaking psychologists. With the Scottish writers of the old-fashioned realistic school the term employed for classification was "Intellectual and Active Powers." This twofold division was, in part, responsible for the unfortunate separation of psychology and ethics—the "intellectual" powers being treated under the former head, while ethics treated, psychologically, of the so-called "active powers." With the abandonment of the twofold division by this school, the triple division of mental faculties became prevalent in Great Britain. This change in opinion was very tardily followed by an enlargement of the sphere of psychology proper and a reduction of psychological ethics to its proper place as the psychological study of man considered as capable of conduct. Thus the most modern treatises on psychology in English have done, what all German works have for a long time done, viz., have examined, with a view to description and explanation, the phenomena of feeling and will as well as those of intellect. Meantime, the modern biological way of studying psychology has stimulated research into the nature of feeling and conation, especially in those vague and obscure regions which lie around the very roots of mental life.

It would scarcely be correct, however, to speak of the triple division of mental faculties as "universally accepted." Indeed, the very emphasis which modern science has laid upon the study of feeling and conation, in their more primitive forms of manifestation, has created a tendency in certain quarters to return to the twofold classification of mental faculty. Thus we are told by one writer: "We recognize only two fundamental classes—activity of thinking and affective movement." Both of these are then subdivided by this writer; the former into ideation (both presentation and representation) and judgment, the latter into feeling and willing. It is well known to students of physiological psychology that some of its advocates[2] endeavor experimentally to show that volition *is* nothing more than intensity of sensation. On the other hand, Wundt would apparently have us regard all mental life as developing from the twofold root of sensation and will.[3]

§ 5. Many of those who officially adopt the threefold division of mental faculties proceed, in the interest of scientific explanation, to do away with the real and fundamental character of this distinction. Reference has

[1] Kritik d. Urtheilskraft, Einl. And see Hamilton: Lectures on Metaphysics, xi. and xx., for a history of opinion.

[2] Münsterberg, for example, of whose views later on.

[3] Physiolog. Psychologie. In the 2d ed., p. 455, his words are: "Sensation, feeling, will, or —since experience always approximates a reference of feeling to will—at any rate, sensation and will, appear to offer themselves as elementary data, independent as such of each other."

already been made to the method of Herbart and his school.[1] The way of the traditional English and Scottish psychology has for some time been to distinguish knowledge, feeling, and will as *the* three faculties, and then to proceed to argue the "dependence" of will on feeling, and feeling on knowledge. This argument has often been carried to the absurd length, which leads Sully[2] to remark: "A twinge of toothache or of muscular cramp, is not first apprehended under its qualitative aspect, a twinge, and then felt as pain." In opposition to the extreme view, another—equally extreme perhaps, but certainly not so absurd—has arisen, which regards (so Horwicz, Körner, and others) feeling as prior to intellect. But here it may at once be pointed out that there is no feeling in general, as psychic fact. Every really existing feeling is an aspect of some conscious mental life, is just this peculiar feeling and no other. But how can this be, without at least some low form of discriminating consciousness? And *discriminating* consciousness, *quoad* discriminating, *is* the aspect of psychic facts which we call intellection. If, then, there were any psychic fact of "pure" feeling, without even the least admixture of discrimination or conation, by way of attention in its lowest form, such a psychic fact could neither be known to exist as state of my consciousness, nor inferred as state of any other particular consciousness, nor imagined as state of any possible consciousness. In other words, we find, infer, and imagine, all states of consciousness as having these three elementary and underived aspects. And it is only as either immediately found, or inferred, or imagined, that states of consciousness can be classified, or made the data for the conclusions of scientific psychology.

[Besides the references already made, the following works may be consulted concerning the division of mental faculties and the classifications of psychology: Ballauf: Elemente d. Psychologie, Die Seelenvermögen, Absch. 2. Brentano: Psychologie, chap. iv., ix. Bain: Senses and Intellect, Introduction. Höffding: Psychology, iv. Drobisch: Empirische Psychologie, v., 2. Mohr: Grundlage d. Empirisch. Psychologie, § 14. Cruger: Grundriss d. Psychologie, § 1. This last-mentioned writer expresses the ground of the threefold division in the following succinct way: "Die psychischen Erscheinungen oder die Vorgänge in unserer Seele sind von dreifacher Art; es geschieht erstens etwas *in uns*, zweitens *mit uns*, drittens *aus* oder *durch uns*."]

[1] Dr. Ward, after affirming (Encyc. Brit., art. Psychology, p. 39) that there is substantial agreement as to the impossibility of expressing the elementary facts of mind in less than three propositions—I feel somehow, I know something, I do something—proceeds to advocate what seems to be a modification of Herbartian and traditional English views as to the nature of feeling and its dependence on knowledge.

[2] The Human Mind, i., p. 70.

CHAPTER V.

PRIMARY ATTENTION

It has been customary, until comparatively recent times, for writers on psychology to speak of attention as in some sort a special faculty or function of the mind. And this usage has indeed much in our ordinary experience and language to sanction it. For do we not prize highly the cultivation of the power of voluntarily concentrating our energies upon selected ends; and what distinguishes men, whether as respects native gifts or acquired accomplishments, more than their marked differences in the exercise of this power? Moreover, all men know perfectly well what is required of them when they are exhorted to "hearken" or to "look," to taste or smell, and try the quality of any substance, or to "feel" and find out for themselves whether the particular object be smooth or rough, hard or soft, fluid, viscous, or solid. The difference between merely seeing and looking, hearing and hearkening, tasting or smelling or feeling in a passive and in an active way, happening to remember and trying to recall, thinking and letting our thoughts run, is consecrated by much experience and by many forms of speech.

Attention, in the meaning with which the word is employed to characterize certain conscious and purposeful performances of the adult, is not improperly called a special faculty or power of mind. But, then, in this case, attention, like all the other cognate faculties or powers so-called, is the result of development. That is to say, it is a progressively acquired mental function, involving intellection, feeling, conation—all combined—in a peculiar way. This becomes evident when we consider analytically what we mean by an act of attention (an exercise of the "faculty of attention") in its most highly complex form. We mean, of course, *a purposeful volition, suffused with peculiar feelings of effort or strain and accompanied by a changed condition of the field of discriminative consciousness, as respects intensity, content, and clearness.* To illustrate: we will suppose that one is "being read to," but has ceased for the moment to listen to what is being read; and then, that one is summoned by a question of the

reader, back from one's pleasant or sad wanderings of thought, and begins again to "attend to" the matter in hand. The abrupt change in the flow of consciousness which the question immediately occasions is now followed by another change, which, though less abrupt, is even more wide-reaching, wonderful, and strongly marked. To characterize figuratively the beginnings of this change, we might say: a summons is issued to the forces of the soul to rally, to marshal themselves, to submit to discipline, to do in a definite and purposeful way a certain piece of work. And now that we are really listening with fixed attention, the voice of the reader is notably louder, even when considered as mere noise. Moreover, a far larger number of the words, as just such words and no others, is now understood; probably, also, the content of consciousness becomes widened and the number of factors or objects, more or less clearly discriminated in the field of consciousness, becomes notably increased. A faint feeling of effort, having its seat, as it seems, rather deeply within, may be recognized, for we are trying to attend not only to the words, but to the thoughts of the writer; and this effort seems to involve the control, in some purposeful way, of the train of representative images awakened in the stream of our own conscious life. So often as our thoughts tend again to wander from the reader's words, we resolve anew that it shall not be so; and, with a somewhat increased feeling of effort, it may be, we bring our thoughts back again.

What is the fuller meaning of the changes effected in the field of consciousness by voluntary attention, when they are translated into the language of psychological science, can appear only later on. We now note simply the fact that *such* attention involves the trained exercise of the developed functions of intellection, feeling, and will, in a highly complex way. Such attention may rightly be called a complex faculty, dependent for the character it attains upon the development of all the three primary faculties which manifest themselves in every state of consciousness.

The foregoing conclusion suggests the truth of another which is much more difficult of analysis. No break is anywhere apparent in the evolution of mental life, at which we can say, just here the faculty of attention begins to be exercised.

While, then, the higher forms of attention require the development of all the faculties, we find in *primary attention* the facts which make possible the developed form of attention, and so the elaboration of all faculty. If we did not attend in this primary way (unthinking, involuntary way), then the organization and elaboration of mental life could not take place at all. We

treat, therefore, of primary attention as a most general form of all mental life. For, thus understood, attention is the unceasing accompaniment and indispensable condition of the development of faculty, of the entire growth of mental life.

§ 1. The neglect to recognize duly the universal and elementary character of attention—of *some*, and *some kind of*, attention—in every mental state, in every field of consciousness, has led many writers on psychology to discuss the subject as though it had to do with one faculty only (will, as intelligent choice); or as though it involved only a late and highly developed form of psychoses. Thus Volkmann, although he advocates the "genetic" method and treats the mental life as a development, does not reach the discussion of "attention" until p. 201 of his second volume. On the other hand, Dr. Ward and Professor Sully, among English psychologists, have perhaps most clearly recognized the true psychological import of attention. The former writer holds that the "relation of presentation itself" (the having of any "ideas before the mind," any states of discriminating consciousness), "implies what, for want of a better word, may be called *attention*, extending the denotation of this term so as to include even what we ordinarily call inattention. Attention, so used, will thus cover part of what is meant by consciousness—so much of it, that is, as answers to being mentally active, active enough at least to '*receive* impressions.'" Thus we are rightly reminded that "what we ordinarily call inattention" is not total absence of attention, but rather diminished amount of attention, or attention directed to other objects than the ones which would seem proper under the circumstances; or diminished amount of purposeful volition, with a lessening of the accompanying effort, in attention. It is no unmeaning jest to say that the idle school-boy is often more attentive (to other objects in diverse fields of consciousness) than he would be if he strictly attended (to his lessons). The truth that *inattention is still attention* is expressed in the popular language when we say: Are you attending strictly to *me*, or to *it*—to *this* thing, to the exclusion of *that?* The truth of the vague statement of Ward, that attention thus covers "part of what is meant by consciousness," has already been indicated, but will appear more clearly as we discuss the relation of primary attention to all the factors and phases of every field of consciousness.

In the effort to reduce the phenomena of attention to their lowest terms, some writers have, on the other hand, made their theory of the subject far too simple to satisfy the demand of our indubitable experience. This is true of the view—already mentioned—which attempts to identify attention with conscious increase in the intensity of sensation. This view not only results in denying the reality of so-called "voluntary attention," but it overlooks the complex relations which exist among the factors of even the lower forms of mental life, considered as being, all of them, recognizable states of an active subject, or *Ego*, whatever we may mean by this latter term.[1]

[1] Another class of writers—the psychologists of the English empiricist school, such as Locke, Hume, Hartley, the Mills, and Spencer—are justly complained of by Professor James (Psychology, I., p. 403), because they hardly notice "so patent a fact as the perpetual presence of selective attention" in all mental phenomena. This neglect James considers due to their unwillingness to attempt a problem whose solution would so obviously interfere with the "smoothness of their tale."

§ 2. That voluntary, purposeful attention is a development involving a higher organization of the same factors and relations which are nascent in primary attention; that primary attention itself involves all the primary forms of mental function—intellection, feeling, conation; and that its very essence consists in certain recognizable relations existing among these primary forms of mental function: these are truths virtually admitted by the keenest writers of modern times on this subject. Thus one author (Esser) defines attention as the power of the spirit to apply its intuiting activity to an object (external or internal) in a preferential or exclusive way; and to do this with "the design to win a clearer and more significant cognition of the object than is customarily the case." Another (Lipps) denies that the distinction between voluntary attention and involuntary attention is essential or fundamental. All acts of attention are indeed acts of will, but we find nothing of an external "being-directed," as it were, of the attention. Yet primary attention is to be understood as mental activity supporting and enhancing the effect of stimuli already acting on the mind. Attention is thus a word which we might substitute for *psychical energy*, rising and falling in response to stimuli, and so reacting to vary the extent and clearness of the field of consciousness. Still another psychologist (Horwicz) would use the word attention for all the different activities of mind considered as different in respect to their degree. In general, then, attention is nothing but that receptivity of the soul (*subjective* receptivity) which is demanded for the perception (the conscious recognition) of stimuli. Attention, says another (Drbal), is "the direction and absorption (*Vertiefung*) of consciousness into some already existing or expected sensation or idea." While, finally, one writer (Dwelshauer) would have us consider attention as the exterior side—visible, in some sort, to ourselves—of that process through which we pass in the clear and intelligent perception of objects.

§ 3. We may make our conception of attention clearer by considering that experience which is sometimes described as "coming to consciousness." What it is to "come to consciousness" from total unconsciousness cannot, of course, be conceived. To attempt this would be like trying to describe the passage from nothing to something by a path which, from its very nature, can never be known. But we frequently discover a process of enlargement or diminution—as we say, with a natural and suggestive application of space-terms to mental experience—in our mental life. Indeed, it is just this phase of our mental experience which has already been described in terms of the difference—as respects richness of content, intensity, clearness of discriminating activity—of our different fields of consciousness. As we "come to ourselves" out of drowsiness or a fit of abstraction, we begin more and more to yield or to enforce (upon ourselves) attention. That complex change in the relations between the different factors and phases of the mental states which marks this process of coming to consciousness is evidently closely allied to the increasing amount and changing distribution of attention. In somewhat the same way we may think of the infant as "coming to" more and higher degrees of conscious life, as its powers of voluntary and involuntary attention are developed.

To illustrate the nature of primary attention as connected with the rise and fall of psychic energy, let us take an example. You sit, half dozing and

half day-dreaming, by an open window in a city street. You have nearly "lost yourself" completely. The noise of the street—rattling of carts, sound of voices, tinkle or clang of car-bells—is as a soft, irregular humming in your ears. Vague and confused pictures of the outside world, interrupted by the frequent closing of the eyelids, come and go upon the eyes. All definite feelings are merged in the general feeling of bodily quiet and comfort. The thoughts and mental images are wandering at *their* will. But now you, as slowly as it is possible, we will suppose, "come to yourself" again. Gradually the particular sounds arising in your environment define themselves—coming, going, returning, with now some and now others more clearly defined; the same thing happens, *pari passu* almost, with the particular sights. The general feeling of bodily quiet and comfort gives place to more clearly discriminated sensations of *malaise*, due to the uncomfortable chair you have occupied. But, above all, do you remember what you have been doing, where you are, and what you ought to be doing. Your thoughts clearly define themselves, and you resolve that they shall be yet more clearly defined, shall be kept in that condition. You have *your* will over the mental images which have been having their will. You are now "fully yourself" again.

If, then, we consider the description of those changes which the successive fields of consciousness go through in the process of coming to a fuller consciousness, we find that it essentially corresponds throughout to the description already given, of the changes produced by increasing exercise of the power of attention. The conclusion is then warranted, in a preliminary way, that *primary attention is a form of psychical energy which necessarily enters into the determination of the character of every field of consciousness.* In other words, *primary attention is a most general form of all mental life.*

The Physiological Conditions of Attention are, in their most general form, essentially the same as the physiological conditions of all conscious mental function. These are the integrity of the nervous substance; the supply of a sufficient quantity of properly aërated blood; the molecular activity of the so-called "psychic" nerve-cells and nerve-fibers, with the resulting conversion of stored into kinetic energy and the fall of tissue from a condition of highly complex chemical constitution and more unstable equilibrium to a condition of less complex constitution and more stable equilibrium. This general identifying of the physiological conditions of primary attention with those of all conscious mental life is another argument for considering attention as a most general form of that life. In the same direction points the correspondence between those changes in the character of attention which we observe in sleep and those physiological changes which we have reason to believe belong to sleep. In dreams the wandering, unpurposeful character of attention, and the consequent low condition of discriminating intelligence, feeling, and choice, are characteristic of the stream of conscious-

ness. And as this lowering of attentive faculty increases, the energy displayed may dip below the "threshold of consciousness;" in sleep we sink into the unconscious, and so cease to attend to aught in our world of psychical activity. But the physiological changes which condition the characteristic changes in the attention during dreams are all in the direction in which a still further movement (as the so-called curve of sleep rises higher) brings us to unconscious and dreamless sleep.

The more particular physiological conditions of attention are the concentration of arterial circulation, and of the connected molecular activity of the "psychic" nerve-cells and nerve-fibers, within some of the cerebral areas, and the relative withdrawal of such circulation and nerve-activity from other cerebral areas. They consist also in the concentrated expenditure of nervous energy in certain forms of nervous processes to the relative withdrawal of energy from other forms. In other words, just as conscious attention, in its most primary form, appears as a *focusing of psychical energy* upon some phases, or factors, or objects, of consciousness, and the relative withdrawal of such energy from other phases, factors, objects: so do the physiological conditions of all attention seem to involve the *focusing of physiological function* in some of the cerebral areas, or forms of nerve-energy, and the withdrawal of such function from other areas of the brain or forms of its energy. Thus both that restriction, and that intensifying in a particular direction of our conscious life, which all attention implies, have their correlatives in the particular physiological conditions of attention.[1]

Increase in the intensity of attention (the amount of "paying attention," so-called) has for its physiological condition the increased expenditure of nerve-energy. While this is emphatically true of voluntary attention when directed with continuous effort upon difficult and disagreeable tasks and objects, it is also true of all attention, even the most primary. On the other hand, the distribution of discriminating attention over a larger number of objects, for purposes of comparison, has its physiological conditions in the spreading of physiological function from some so-called "center" of the brain to another—thus involving, in a milder way, a larger amount of the connected areas of the brain.

Another condition of attention is to be found in the connection between this form of psychical activity and the activity of the striated muscular system. This connection has led one enthusiastic writer[2] to affirm that "all study of psychology ought

[1] Comp. Dr. Cappie: Physiology of Attention, etc., reprinted from Brain, xxxiv.

[2] See Dwelshauer: Psychologie de l'Apperception, p. 118, where this dictum is quoted with approval.

to begin with muscular physiology." From the point of view of conscious experience, we find that we cannot voluntarily attend without feeling that we are *accomplishing something* by our attention. The feeling of holding our organs steady seems to form no unimportant part of the support which the mind receives in its effort to give fixed attention. Now, it is by fixation of attention that the striated muscle connected with the organs both of sense and of motion is put into this condition of physiological tension. It is the return feeling of this tension which defines still further the character, and serves as the continuous support, of our act of attention. All this involves the connection of the striated muscles with the cerebral organs and with that modification of consciousness which we call "attention."

§ 4. The effect of impaired integrity of the nerve-centers, or of abnormal conditions of blood-supply, upon attention is apparent in many cases of mental alienation as well as in certain experiences common to all. Among the former are those diseased conditions where some particular field of consciousness becomes relatively stable or fixed to an abnormal degree. *One* idea, *one* feeling, *one* fancy—as we, with an excusable exaggeration, declare—becomes almost the sole object of attention by the mind. This abnormal condition has been called "hypertrophy of attention." In other cases the abnormal condition consists in a large or almost complete impotency to attend fixedly to anything. Here, if the general psychic energy of the subject is great, "the current of ideas is so rapid and exuberant, that the mind becomes a prey to unbridled automatism." [1] But if there is comparatively a low degree of psychic energy, the current of ideas may not be rapid and exuberant, but the sufferer is still unable to control the mental train. It exists and attends to itself *for him*; he cannot attend *to it*, or to any particular part of it.

The action of disease, fatigue, drugs, social environment, and climatic changes, to excite or depress the attentive, discriminating consciousness—and this in ways resembling those with which the maniac and the idiot are afflicted—is too well known to need further elucidation.

It may also be noted, in this connection, that animals who have lost important parts of the substance of the brain, or have this substance otherwise impaired, show the effects in changes of the power of attention. The "soul-blindness" and "soul-deafness" exhibited by the dog that has had comparatively small areas of his cerebral substance extirpated is partly due to loss of power to attend; [2] and so is the large impairment of memory and intelligence which the removal of considerable portions of the brain produces. Nothing is more distinctive of idiocy, or of that "loss of mind" in which general paralysis culminates, than the connected impotency of attention.

§ 5. Attention implies work being done in the brain; it is itself the indispensable prerequisite and accompaniment of all mental work. This the

[1] See on this subject, Ribot: Psychology of Attention, p. 78 f.

[2] See the author's Elements of Physiological Psychology, p. 269 f.

physiology of nervous function makes apparent. The waste of brain-tissue has been found by Byasson and others to correspond, at least in a general way, to the amount of work accomplished with stress of attention. For this reason the physician bids his patient, whose brain is "tired" or "worn out," cease to attend to business, not to try to think, not to mind his painful emotions and feelings, etc.

The same truth is abundantly proved by the established relations between attention and reaction-time. Insufficient, irregular, and too prolonged attention, all lengthen reaction-time; active, steady attention, not prolonged so as to produce inattention through weariness, shortens reaction-time. If the reacting agent is taken "off guard," as it were—that is, unattentive—he reacts much more slowly and inaccurately. But in all activity of the brain, time and amount of work done are related in an intimate way. Expectation and attention already focused result in getting part of the work necessary for clear recognition of an object accomplished before the object appears; but if attention has been overstrained, through too long expectation, the work is lost, and the brain is left out of condition for more work. Thus Wundt found that when one is warned by a signal to expect, after a convenient interval, the sound made by a falling ball, the time necessary to discern this sound (as compared with the time necessary without any signal) is reduced from 253 σ to 76 σ when the ball falls 25 ctm., and from 266 σ to 175 σ when the ball falls 5 ctm. Another experimenter (Beaunis) found that reaction to the latter of two visual impressions, where the former serves as a signal, varies in time according to the interval between the two impressions. Thus, as the time of expectation increased from 300 σ to 500 σ or 600 σ, the time of reaction increased from 155 σ to 205 σ; but as the time of expectation increased above 600 σ up to 4,000 σ, the time of reaction diminished to 143 σ.

More recent researches, while they have modified these figures and shown the great variety of influences connected with variations in attention, have confirmed the general principle.

In prolonged and concentrated voluntary attention, directed to the clear discrimination of objects, *a large amount of work is being done in the cerebral hemispheres*. The subject who is reacting under these conditions often, though sitting quiet, sweats profusely. The results of such attention in exhaustion, both of brain and of end-organs of sense and motion, is too well known to need more than a mention here. But it is in such states that the entire field of consciousness is heightened, as it were. Psychic energy in all the directions of intellection, feelings of strain and effort, and active conation, is then at a maximum. This maximum of psychic energy, with its characteristic increase of attention, is conditioned upon a maximum of work being done within the psychical basis of our mental life. Such expenditure demands the repair which deep, and if possible, unconscious sleep alone can bring; in such sleep there is no attention and nothing to attend to.

§ 6. The connection of attention with the condition of the muscular system is illustrated by the more obvious physical changes which accompany attention. Among these none are more prominent than the changes in respiration. The character and time-rate of our breathing vary with the rise and fall and changing focus of attention. Sighing, for example, is a modi-

fication of respiration common to attention and to physical or moral pain. In heightened attention we hold the breath; and after prolonged attention, as in case of inattention, one is likely to yawn. Unceasing vaso-motor changes accompany changes in consciousness as affected through attention. When attention is highly concentrated, the heart may almost stop beating. Ribot, in treating of this subject, has pertinently referred to what Malebranche says of the effect wrought upon him by his first wrapt attention to Descartes' treatise *De l'Homme*. It "caused such a violent beating of the heart that from hour to hour he was compelled to lay the book aside, and break off its perusal, in order to breathe freely."

In view of such considerations as the foregoing, the claim has been made that every volition, whether impulsive or inhibitory, whether voluntary or involuntary, "*acts only upon muscles and through muscles.*"[1] The truthfulness of this statement depends upon how we understand it. If it be pressed so as to mean that attention *is* only the psychical equivalent of muscular strain, the passive resultant of the sensations which vary in intensity as the action of the muscle rises and falls, the statement may well be denied. But if it means that in every act or state of attention, of whatever kind and in whatever degree, motor elements connected with the changes in the muscular fiber play an important part, then there is little doubt of its truthfulness.

The considerations already advanced are closely connected with two important topics: these are the Variations of Attention and the Distribution of Attention. Ordinary observation shows that we do not easily and naturally attend to any object in the field of consciousness, or to any phase of our own mental life, with a long-continued and perfectly uniform strain of attention. Indeed, we cannot, by the highest and most strenuous exercise of will, bring about such an activity of attention. Just as the entire gross amount of our psychic energy may be said constantly to be rising or falling, so the amount of this energy bestowed upon any one element or group of elements or objects undergoes processes of diminution and increase. This *variable character* marks all kinds and degrees of attention—slight attention and strict attention, forced or spontaneous, voluntary or involuntary attention, and attention focused upon objects of perception as well as upon states of our own feeling or ideation. Neither the attention "wrung" from us by the toothache nor that "solicited" by our interest in the object we are viewing under the microscope escapes this movement. For certain small fractions of a minute we almost or quite forget the torture; and we not infrequently have to call back our wandering mind and renew attention to some particular part of the microscopic field. In all voluntary and highly attentive perception the same

[1] Ribot: Psychology of Attention, p. 51.

thing is to be noted. Errors in astronomical observations, for example, are caused by oscillations of attention, which even the trained observer cannot wholly prevent. When we confess to the weakness of being unable long to follow any line of thought, we are confessing, at worst, only to a somewhat greater degree of that weakness which all mental life inevitably feels. It has been experimentally shown,[1] indeed, that attention cannot be so steadily held to its work of perception as to feel the changes produced by regularly increasing or diminishing pressure upon the tips of the fingers as a perfectly continuous augmentation or decrease.

Closely connected with the rise and fall of psychic energy in all attention is the *distribution of attention.* In all degrees and kinds of attention there is more "given" to some objects or phases of the field of consciousness, and less to other objects or phases of the same field. At any given instant in the mental life, and with respect to every particular complex mental state, we may say that attention is "withdrawn" from some things and "concentrated" upon others. If the so-called withdrawal is complete, then the objects from which the attention is withdrawn drop out of the complex mental state. To sink "below the threshold" of consciousness, and no longer to "get any attention" whatever, amounts to one and the same thing: so intimately connected is primary attention with all states of consciousness. On the other hand, an absolutely complete concentration or absorption of attention in any one thing is equivalent to the cessation of discriminating consciousness. Besides those objects in the field of consciousness on which attention is concentrated, others must be said to have at least a minimum of vagrant and vague attention attracted to them. Moreover, as the stream of conscious life flows on, attention constantly becomes redistributed. This follows necessarily from the almost ceaseless changes which go on in the entire amount of psychic energy to be distributed, and also from the augmentation and decrease of the particular amounts of such energy belonging to the different factors and objects of every part of the stream. Distribution of attention is ceaseless redistribution, and redistribution of attention is equivalent to the "refocusing" of attention.

While all kinds and degrees of attention and all states of consciousness considered as dependent upon the presence of attion conform to these general principles, a marked difference

[1] By President G. Stanley Hall and Dr. Motora. Comp. Am. Journal of Psychology, 1887. No. 1.

exists between voluntary and involuntary attention, as respects both the variable amount of attention and its distribution. This undoubted difference in our conscious experience is expressed and consecrated by all the language customarily employed. An act of will fixating the attention with a definite purpose in view, within limits which vary for different individuals, circumstances, and kinds of conscious states, influences both the rhythm and the distribution of attention. This fact may be stated in a popular way by saying: I can "fix" my attention on this thing, can "check" or "inhibit" it from dropping off, at least a little longer than it otherwise would; or I can "decide" that *this* thing rather than that shall have the larger share of my attention, at this time—*if I will*. But, on the other hand, I know that the vacillation of attention is, outside these very narrow limits, quite beyond my control; and that very many of my experiences solicit, demand, require, the larger share of my attention, whether I will it so or not. Such distinctions confirm our preliminary view, that, *whereas voluntary attention is of the nature of a developed and trained faculty, primary attention is a necessary accompaniment of every truly psychic fact.*

§ 7. The variations of attention have been the subject of much experimental investigation as well as speculative discussion. The attempt has been made to establish, experimentally, a definite periodic variation or rhythm for the different forms of sensation; but the investigations have thus far resulted in increased doubt and discussion over various important points. Among these are the following: Is there a special organ or part of the brain concerned in "apperception" (or clearly recognitive perception)? Is a so-called "act of will" anything more than a "peculiar complex" or "definite grouping" of sensations? Has the "feeling of effort," periodically evoked in connection with the varying degrees of attention, a central (*i.e.*, within the brain) or a peripheral (*i.e.*, in the contracting and relaxing muscle-fiber) origin?

The *rise and fall of attention* in connection with the varying intensity of sensation, or varying extension of objects in the field of consciousness, may be illustrated by many forms of experiment. When we are attending to any sensation which is periodically repeated, and very weak (or near the "threshold of consciousness"), fluctuations in the intensity of the sensation constantly occur. Indeed, an objectively constant weak stimulus may be so gauged (for example, by holding a ticking watch at the right distance from the ear) as to come and go in consciousness (that is, at a certain distance, no matter how steadily we try to attend, some ticks of the watch will not be heard). Helmholtz showed that a black radius on a white disk can be made to lengthen and shorten alternately by fixating it with a steady attempt at uniform attention. A revolving gray disk, looked at in this way, undergoes rhythmical changes in its apparent brightness. These vacillations, as we have already said, were thought to have a different period for the different

sensations. Thus Lange[1] gave the period, from one optical maximum of sensation to the next, at 3 to 3.4 sec.; but the corresponding period for acoustic sensations at not less than 3.5 to 4.0 sec. He also considered that the two periods could not be made to correspond exactly. The periods of oscillation for memory-images he fixed as follows: for acoustic sensations, 3.7 to 2.8 sec.; for optic, 3.1 to 2.6 sec.; for electrical touch, 2.1 sec.

Ebbinghaus, while experimenting to determine the laws of the simplest and most nearly primary forms of memory, came upon a similar remarkable rhythm in attention. He experimented to determine how many "non-sense syllables" could be learned and remembered, in series, under different conditions of learning and remembering. But he discovered that both learning and remembering seemed to show a kind of periodic oscillation of the mental susceptibility to attend, in which the increasing fatigue "varied about a gradually shifting middle position." Thus, in eighty-four experiments with six sixteen-syllable series, the mean time required for learning was as follows: for the first, 191 sec.; for the second, 224 sec.; for the third, 206 sec.; for the fourth, 218 sec.; for the fifth, 210 sec.; for the sixth, 213 sec.

§ 8. The determination of the rhythm of attention, experimentally, is closely connected with the experimental study of the *distribution of attention*. In the periodic swing of attentive apperception, where the objects are at all complex, what happens between two maxima of attention is not a total loss of consciousness; it is not merely a diminution of the gross amount, as it were, of psychic energy. It is also—and frequently it is rather—a temporary wandering of the attention to some other object or factor in the field of consciousness. When, for example, the ticks of the watch drop out of consciousness, I cannot listen to them with a steady strain of attention, for my attention is "wandering" to some other sound or to some different kind of sensation in the total field of consciousness. The way in which the hypnotic subject passes into the hypnotic condition, by means of fixation of attention, is worthy of study at this point. The relief from the steady strain of attention to the bright light at which he is gazing may come either by wandering of mind to something else—other object fixated for a moment, or idea arising in the mind—or by sinking into unconsciousness through somnolence followed by deep sleep.

Experiments abundantly confirm, what common experience suggests: namely, *the arising of any new factor or object in the field of consciousness takes place only in connection with the redistribution of attention*. The phenomena of "distracted" attention are in point here. In fact, distraction of attention, if the aggregate of psychic energy be not increased, necessarily follows upon the introduction of any such new factor or object. Let us suppose the fol-

[1] Philosoph. Stud., iv., Heft, 3 and 7. Urbantschitsch had already aimed to show that these oscillations could not be due to variations in the objective stimulus. In the case of acoustic sensations (the ticking watch), he attributed it to exhaustion of the acoustic nerve. But Lange maintained, with excellent show of reasons, that the oscillations have a central origin. Münsterberg, however, has vigorously attacked Lange's explanations (in his Beiträge, etc., 1889, Heft 2). He experimented by fixing the eyes on the line of demarkation of a disk, 2 meters distant, and recording the ebb and flow of sensation by movements of the finger. Finding that rapid breathing diminished the interval (from 6.9 sec. to 5.1 sec.), and slow breathing increased it (up to 8.5 sec.)—and on other grounds—he concluded that the oscillations originate in muscular fatigue. While we think Lange's peculiar theory of the *character* of the alleged central process extremely doubtful, his general conclusions on this point seem unshaken.

lowing series of experiments instituted to test the "disturbance (or changed distribution) of attention." First, we have a series of simple muscular reactions in response to a stimulus of light; second, the same reactions are taken while a weak reflected light flickers across the field occupied by the light to the stimulus of which the reaction is to take place; third, the attention is still further disturbed by the image of a revolving card. The average times of reaction for the three series were found to result as follows: for the first series, 140 σ; for the second, 148 σ; for the third, 139 σ. Here we apparently find that, while the reacting agent was able to attend to the light so as not to be observably disturbed by so *monotonous* an object as a revolving card, he could not do this for anything so *distracting* as a flickering light. Experiments with other more decided disturbances of attention showed the reaction-time prolonged from 143 σ to 171 σ.[1]

Binet[2] attempted to solve experimentally this problem: If a normal person is compelled to press a tube a certain number of times, once in so often, with a given uniform pressure, and at the same time conduct some complicated mental operation, like doing a sum, reading aloud, etc., what will happen? What did happen in the case of his experience may be summed up under these four heads: (1) irregularity of interval in the exertion of the pressures upon the tube; (2) diminution or slower rise of the curve of pressure; (3) incoördination of movement; (4) dropping of some of the volitional acts out of clear consciousness. It thus appears that the changed distribution of attention (distraction in some directions and concentration in others) exercises a dynamical modifying influence upon all the sensory-motor life.

Another interesting discovery, made while experimenting in reaction-time, would seem to throw more light upon this subject. Some years ago it was pointed out[3] that two normal methods of reacting may be detected, in one of which the subject of experiment concentrates his attention on the sensation and avoids every tendency to get the motion ready; in the other, attention is concentrated upon the motion to be performed. These are called "sensory" and "motor" (or "sensorial" and "muscular") reactions, respectively. The time of the former was at first thought to be uniformly longer than that of the latter, in the proportion of about 223–230 σ to 123–137 σ. It has since been shown[4] that this distinction applies only to very simple reactions, where little activity of attention is necessary to discriminate the character of the sensation to which the reaction is to be given. Even under these conditions the difference in time between the two kinds of reaction is not stable.

[1] See art. on Disturbance of the Attention during Simple Mental Processes, by E. J. Swift: Am. Journal of Psychology, Oct., 1892. Experiments in the Yale psychological laboratory, by Dr. Bliss (Yale "Studies" for 1892–3), show that the influence of many such distracting sensations can, by practice or express volition, often be rendered speedily unappreciable. They also illustrate the important general truth that the causes of variation in attention are exceedingly manifold. And, in general, the most recent careful experiments by Esser, Cattell, Mosso, Lombard, Pace, and many others, prove that we can scarcely speak of the "periodicity," or "rhythm" of attention, meaning by this that the times of successive risings and fallings are regular and can be definitely fixed for particular sensations, circumstances, etc.

[2] Art. Concurrence des États psychologiques: Rev. Philosoph., Feb., 1890.

[3] By Lange: Philosoph. Stud., iv., Heft 4. p. 479 f.

[4] By Götz Martius: Ueber die Musculäre Reaction und die Aufmerksamkeit—Philosoph. Stud., vi., Heft 2.

The same problems have also been experimentally approached by researches into the variations of attention connected with accommodation of the eye,[1] and the effects of fatigue upon the contraction of the voluntary muscles.[2] Both classes of researches seem to show that, while something like a rhythmic change of psychic energy necessarily takes place, its periodicity is so inconstant as to make it attributable to no "functional rhythm natural to the external mechanism" simply; the rather do variations of attention, as the equivalent of the rise and fall and redistribution of psychic energy, express a vast variety of causes having, in part, their seat in the very centers of psycho-physical life.

In general, then, experiment confirms the view that *the focusing of attention and its consequent redistribution changes the relations between the amounts of psychic energy spent in feeling, discrimination, and conation.*

§ 9. It is now clear in what meaning of the words we may insist upon the *selective* character of all, even the most primary, attention. If by the word "selective" be meant to affirm that distinct and purposeful volition characterizes all attention, or that such volition can wholly overcome the forced and mechanical character of the combinations of factors and objects which take place in the field of consciousness, we certainly cannot use the word "selective" of all our acts of attention. But it is of the very nature of all attention to be "selective," in that differences exist among the different factors and objects in every field of consciousness, which differences grow out of that selecting and rejecting process, in which the distribution of psychic energy consists. Some of these factors and objects always *get selected*, and some of them accordingly *get left*, in the change which the focuses of concentrated attention undergo. And all this is not, as yet, the result of a special faculty. It is rather of the very essence of psychical life.

The Relation of Attention to the various primary Forms of Mental Life may now be considered anew in the light of our conscious experience. We have seen that the distribution of attention is inseparably connected with the degree in which each of these primary forms manifests itself in every state of consciousness. According as intellection, feeling, or conation is emphasized in each state, and so the complexion of the entire state influenced or determined, the distribution of attention takes place. But, conversely, as the distribution of attention takes place, so the different phases and objects belonging to the one mental state get emphasized, and the complexion of the entire field of consciousness is influenced or determined accordingly. Putting both these propositions together (and, indeed, the two only serve to approach the same truth from different sides), we may reaffirm the conclusion already virtually reached: *Primary attention, essentially considered, is the variously related degrees of*

[1] E. Pace: Zur Frage d. Schwankungen d. Aufmerksamkeit, etc.

[2] Lombard: Effets de la Fatigue, etc.—Archives Italiennes de Biologie, XIII., iii. And comp. Journal of Physiology, xiii., 1 and 2, 1892.

psychic energy expended upon the different aspects, elements, and objects, in the one field of consciousness. Now, the three primary aspects of all mental life are intellection, feeling, and conation. All elements of every field of consciousness come under one of these three aspects; that is to say, they are elements of intellection, or elements of feeling, or elements of conation. All objects known in any field of consciousness are constituted and held in consciousness only by activity of the mind as intellection, feeling, and will. With variations, therefore, in these three necessarily connected aspects of all mental life, the different so-called kinds of attention become apparent. With the development of mind, as intellect, feeling, and will, the higher and more rational (the intelligent and voluntary) form of attention is made possible. Intelligent and voluntary attention *is* developed mental life, on one of its most important and characteristic sides of development.

For example, it is customary to distinguish spontaneous attention from voluntary attention.[1] And spontaneous attention may be described as either "impulsive" or "forced." The meaning of these terms, considered as merely descriptive of psychic facts, is perfectly obvious. In spontaneous attention we have little or no consciousness of striving or choosing to attend. Such attention may also be called "passive" attention, in order to distinguish it from the more "active" or markedly *conative* kind of attention. If our feeling is that of being attracted or drawn, without overcoming of resistance (and especially without anything painful in the sensation or thought which attracts or draws us), the attention may be called "impulsive:" we are passive, and yet not by any means inattentive; we smoothly and quietly "yield" attention. But if the feeling which accompanies the change in the focus of attention is one of being compelled—and this happens, especially when we, without choice, attend to vivid disagreeable sensations or ideas—we may speak of ourselves as being "forced" to attend.

First, now, we consider the Relation of primary Intellection or discriminating consciousness, to Attention. In general, attention intensifies and clears up the content of our sensations, ideas, and feelings; and, conversely, the more intense and clearly discriminated are our sensations, ideas, and feelings, the more do they attract or compel attention. We even say of our volitions and choices that recognition of them, and thought about them, varies directly as the amount of attention given to them.

[1] Ribot also employs the terms "natural" and "artificial" (The Psychology of Attention, chap. I. and II.). The latter is a most unfortunate term, since it implies that intelligent voluntary attention is not *natural* in man.

§ 10. The effect of directing attention upon our sensations and feelings is popularly known and embodied in ordinary speech. It may be made more obvious by a great variety of experiments. At any time, for example, if we direct attention to any area of the body, a considerable number of sensations can easily be raised from the obscure and sub-conscious place which they are holding in the general mixture of so-called "bodily feeling" to a recognizable intensity and content. The call, "attend to" the sensations in your finger, arm, back, etc., seldom fails to create sensations that may be attended to, in the particular areas on which attention is focused. This effect of attention on discrimination of sensation, has an obvious physiological basis. The vaso-motor and secretory functions, the circulation and the metabolism, of the peripheral parts of the body are profoundly affected through those changes in the central organs which are involved in the focusing of attention. It is a well-known fact that functional disturbances, simulating disease, and even organic changes, may be induced by too much attention to the bodily sensations. In hypersesthetic conditions of the nervous system one can, by an act of either voluntary or involuntary attention, raise all manner of painful sensations above the "threshold of consciousness." The influence of "suggestion," whether upon those in the hypnotic state or those possessed of normal consciousness, is connected with this power of attention over sensation and feeling. It is customary to speak of suggestions as the influence of imagination. But *attention*, focused in obedience to suggestion, *actually creates the sensations*. A trick of the psycho-physical laboratory, which seldom fails to operate, consists in inducing the subject to feel the warmth of a wire to the rise of temperature in which he is expectantly attending, when no objective rise of temperature actually takes place.

The influence of attention upon discrimination, and so upon the intensity and content of sensation, is illustrated by many of the ordinary experiments in reaction-time. In connection with the law of habit and the activity of memory, it results in such experiences as the following: Repeated acts of attention directed upon the same sensory objects heighten the effects of discrimination in enlarging and making more accurate the contents of the field of consciousness. If a disk, on which are drawn a considerable number of differently colored spots or lines, or of different letters, be displayed for a brief time, by fixed attention at first, only some three to six of these objects can be discerned. But by repeatedly attending to this field, a larger number of these objects is seen after the display of the disk for the same length of time. Within easily attainable limits, each time the disk is attended to the objects already recognized clear up quicker, as it were, and part of the total amount of psychic energy at our disposal is released, to be distributed in increasing the clearness and intensity of the other objects.

Nothing is more patent in the language of the people than the recognition of the effect of attention on the intensity and discriminated content of our feelings. "Never mind it," or "it won't hurt you much, if you do not mind it," we say to children who have got a fall or have cut or bruised their fingers. That is to say, if we abstract attention, or the attention is forced to be withdrawn from any particular sensation or feeling, the latter, by virtue of this withdrawal, suffers in strength and clearness of content.

What is true of sensations is also true of ideas, both of memory and of imagination. If, in trying to recall any complex event of the past, I seize hold of some element or phase in the imperfectly remembered picture of such event, and attend to *it* chiefly, I intensify and clarify it. This particular memory-image—for example, the color of the neck-tie he wore or the letter with which his name began—becomes a sort of nucleus, more vivid and full of content, about which the entire picture of the complex event may be expected to organize itself. On the other hand, any particular portion of a complex memory which happens to appear in consciousness as most vivid and clear attracts or compels attention to itself.

§ 11. Certain writers on psychology deny that it is proper to speak of sudden and strong sensations and feelings as being "attended to." Thus Stumpf[1] thinks it improper to say that one "attends" to a box on the ear. But such a view not only destroys the real import of the most consecrated forms of popular language, but also impairs the continuity and development of mental life. For, as Sully says: "One would like to know the fortunate (or unfortunate?) man who could receive a box on the ear, and *not* attend to it." The very question we should be inclined to ask in such a case would be: "Did you *mind* it much?" And this question might be equivalent to an inquiry, either after the recognized intensity and localization of the painful sensations, which break in upon the stream of consciousness, or after the attendant rush of ideas, feelings, and volitions, consequent upon the more intellectual apprehension of the meaning of the blow. To deny that attention is present, in either case, is to limit the word to a form of mental life which cannot be attained at all except as a development from that more primary form of the same activity for which also we imperatively need the same word. *I attend to everything in mind, and I mind everything to which I attend. Only if this be so can I learn to choose, within limits, what I will mind, and really to mind that to which I choose to attend.*

§ 12. We thus reach a partial explanation of what has been significantly called "attention as adjustment," or "expectant attention." It is no unmeaning paradox to say that every more clearly discriminating act of attention implies previous discrimination by attention; or—to put the truth in the most paradoxical form—there is no attention without previous attention. The various factors and objects define themselves with a *growing* definiteness until they reach a maximum, and then fall away in clearness and intensity, as this particular state of consciousness passes into the next one following. Thus the birth and evolution of every complex psychic fact, looked at on another side, may be considered as the arrest, increased distribution, and falling away of attention. In the case of the momentary display of the disk (in the experiment already referred to), the beginning of the field of consciousness, in which several figures or colored spots come to be recognized, is one of confused impression; the subject of the experiment feels himself to be "coming to" out of this confusion into a condition of attentive recognition, and this after the disk has already been covered up. The same thing takes place when one is invited to "conceive of" some object or psychical state as soon as possible after the word for such object or state is pronounced. In cases of perception, where a considerable amount of

[1] Tonpsychologie, II., p. 268. And see Sully's criticism: The Human Mind, I., p. 146.

discriminating attention is required, to expect *that kind* of an object, rather than some other, facilitates the more precise discrimination of the nature of the object. Other things being equal, one sees *what* precise letters are on the disk more promptly and accurately if one knows that it is *letters* rather than colored spots which are to be displayed. One experimenter[1] has pointed out that, in many cases of voluntary ideo-motor activity, the clear mental representation in consciousness of *a*, for example, is preceded by another condition of consciousness which, according to its content, also contains the (less clear) mental representation of *a*.

The foregoing principle is of the widest possible application. If I have expectant attention focused to hear some sound, then I am ready to discriminate, by attention, whether the sound is *a* or *a*♯, or whether it is the sound of a violin or of a cornet. But if I am adjusted to see something, then I discriminate the better what appears in the field of vision. This is very probably the explanation of what Wolfe found to be true, that the greatest accuracy for memory of the pitch of tones was when the two tones compared had an interval of about two seconds. That is, expectant attention was then focused just right to favor most accuracy of further discriminating attention. The physiological explanation of these facts would seem to imply, as Professor James has claimed,[2] that a double process of adjustment, both of sensory organ and of ideational center, takes place; indeed, such a conclusion follows almost necessarily from all we know of brain, end-organs, and mental phenomena alike.

§ 13. We now get a clear preliminary notion of the nature of the most fundamental processes of *intellectual* life. It has for centuries been pointed out that all intelligence, or "understanding," involves analysis and synthesis. But all attention, considered as variously distributed degrees of discriminating consciousness, consists in this fundamental process of analysis. Attention *is* a process of selective focusing of psychic energy; such a process, regarded as resulting in the growth of discrimination—and implying, of course, for all its higher manifestations, memory and purposeful choice—is analysis. This is the primary condition of intelligence. In its earlier stages the wandering of discriminating attention is not voluntary, in the full meaning of the latter word. It is solicited, impelled, forced. But without attention in this form the organization of mental life cannot be begun or carried forward. And as attention discriminates more and more, the fusion of the discriminated elements and objects into higher and more complex forms (the intellectual syntheses of the advancing organization of experience) takes place.

The Effect of Feeling on Attention is one of those universal experiences to which every man is forced to give heed, not simply in order to understand himself and his fellows scientifically, but, it might almost be said, in order to live at all. The parent, the teacher, the speaker in public or in private conversation, the writer, and not less the merchant or street-pedler,

[1] Münsterberg: Die Willenshandlung, etc., p. 67.
[2] The Principles of Psychology, I., p. 434.

knows perfectly well that the question of gaining attention is, in general, a question of exciting some kind of feeling. In fact, the power which different objects of sense or ideas have to get attention in that "struggle for existence" which takes place in the stream of human mental life is all summed up in one word indicative of feeling. This word is the word "interest." It is acknowledged by all that different minds have very different interests. But with all this great diversity of particular interests it is also the acknowledged universal rule that men attend with ease and effectiveness to what interests them, but only with difficulty and reluctance, or not at all, to what does not interest them.

It has already been said that the very word "interest" is indicative of feeling. To be interesting is to excite feeling. The forms of feeling excited and connoted by this one word are, however, themselves very diverse. The very difficulty of giving attention, at first, or the original repulsiveness of the object to which attention is asked, may be a cause of arousing interest in the man who anticipates that pleasure of triumph or of half-ethical exaltation, which comes from doing a piece of difficult and disagreeable mental work. In all such experience the law of habit is, of course, very influential. But scarcely less influential in the more advanced stages of developed mental life is the presence of the ideals, however low or high, narrow or expansive, which control in a broad way the stream of consciousness.

Another remark of great general importance is this: all excitement of feeling, wrought by whatever object of sense or idea in the mental train, tends to render such object or idea a matter of interest. In the study of those strange and obscure mental phenomena which psychology relegates to the department of feeling, we meet with many examples of this truth. Arousement of feeling, of any kind and in any degree, illustrates the general tendency of the mind to "take an interest" in what arouses the feeling. This is as true of those feelings which, when they reach a certain intensity and complexity of general psychical and bodily reaction, are noted by what we call "horrible," "disgusting," "repulsive," as with what we agree to be "pleasant," "agreeable," "attractive." In an extreme form the truth of this statement is illustrated when we see a group of children gazing with transfixed attention upon the most terrifying spectacles; or note how the novel-reader cannot tear herself away from the harrowing story; or when we ourselves revel while protesting at the strange feeling of irresistible impulse we feel in the horrors of the French Revolution, of the Spanish

Inquisition, or of the morning newspaper. If we temporarily or habitually exclude these things from our attention because we *will* to take no interest therein, then our will and feeling have been disciplined to a somewhat "unnatural" activity in the *interest* of higher ideals.

Attention as correlated with feeling (*i.e.*, dependent for its distribution and fixation upon the excitement of sensibility in connection with the discrimination of different objects and ideas), varies as respects intensity, novelty, tone of pleasure or pain, refreshment or exhaustion of accompanying psychic energy, etc. The infinite variety and wonderful changes in the focusing of attention, as thus considered, are well known, but scarcely admit of detailed description. A few words on several selected points must suffice.

§ 14. "The close dependence of attention on feeling which is implied in the idea of interest," says Sully,[1] "has been remarked by more than one psychologist, but has not yet received adequate recognition." The true state of the case seems to be that psychologists can only, in this sphere, describe a little more vividly and explain a little more fully what every one knows from the results of his daily experience. Accurate quantitative determination of the nature of this dependence by experiment in the laboratory or by collection of statistics, is a difficult or impossible thing to attain. Feeling enters into all knowledge in the form of perception of things by the senses. The influence of feeling on the very constitution of perception is partly attained through its influence on attention. Within not easily assignable limits we see, hear, touch, taste, smell, what we expect, fear, desire, hope for, or are otherwise interested in. The effect of previous adjustment of attention in increasing the discernible intensity and quality of our sensations and feelings has already been shown. But an essential part of this very adjustment of attention is the "feeling of expectation" which necessarily accompanies it. This sort of attention may, indeed, be called *expectant* attention. And since the condition of expectancy is always one of interest, we cannot fail to admit here the dependence of attention on feeling. The total mixture of feelings with which we get ready to receive different objects and ideas, and so prepare the way for further attention by previous expectant attention, is in real life extremely various. Indeed, the whole bodily and mental condition may become involved in this way. Where the intensity of feeling, with expectant attention, becomes too great, it, of course, prevents or confuses the subsequent work of discriminating attention. We become *so* interested in some sort that we cannot attend to the object or idea, on account of distraction from it by our own state of feeling.

What has not been sufficiently remarked by psychologists is the dependence of interested attention itself upon the condition, with respect to attention, of the discriminating and conative functions of the mind. It is undoubtedly true that I attend to what interests me; but it is also equally true

[1] The Human Mind, I., p. 163.

that what I voluntarily attend to, for the realization of nearer or remoter ideal ideas, becomes interesting. It is also true that I decide what I will mind; and what I will to mind becomes interesting and attracts further attention to itself. Or, better—to repeat the fundamental truth—the primary phenomenon of attention partly consists in this varying distribution of psychic energy in which the side of "feeling" in every state of consciousness stands related to the side of intellection and the side of conation. This, however, is far from warranting us in saying, as Stumpf[1] does: "Attention is identical with interest, and interest is a feeling."

§ 15. The power which any object or idea has to attract and fixate the attention, if it is intensely interesting, is intimately connected with the explanation of many abnormal states of consciousness. Students of the psychology of insane and hypnotic subjects are familiar with what are called "fixed ideas" (*idées fixes; Zwangvorstellungen*).[2] These are due to what Ribot, rather inaptly, calls "hypertrophy of attention." They are described by the same author as "the *absolute* predominance of one state or group of states;" strictly interpreted, however, such a thing as this is quite impossible in the mental life. In a more correct, but highly figurative way, we are told that this condition does not allow "the prolification of ideas save in one direction, imprisoning the current of consciousness within a narrow bed from which it cannot escape." But "fixed ideas" are *fixed*, not simply because as processes of intellection, they have become habitual and so constantly recurrent under all kinds of circumstances. *They* are fixed, because of the interest (which may amount to a horrible, enslaving fascination)—that is, of the excitement of feeling which accompanies them—and which *fixates* attention upon them. But looked at from the other and third aspect (the conative and volitional), these same fixed and supremely interesting ideas are spoken of as due to "disease of will."

§ 16. The effect of the different main kinds of feeling which render those objects and ideas that excite the feeling interesting, and so influential to attract and fixate attention, is too familiar to need detailed explanation. The interest of *novelty* may almost be said to be supreme among these. All feelings are, in themselves, interesting. What in the last analysis we are necessarily and forever interested in is our feelings. The most absolutely loathsome and hateful of all conditions of mind is a dull monotone of the affective consciousness, into which no changes of feeling break. In its more intellectual and dilettant form this condition is spoken of as the "feeling of ennui." But even here it is a relief to have the attention attracted to the feeling itself, and to its varying phases, as something novel and so interesting.

The distribution of attention depends upon *intensity* of feeling. This relation, as affecting the discrimination of the degrees and qualities of feeling, has already been remarked upon. But feeling may rise to such a high degree, and may so spread, as it were, over the entire area of the conscious mental life as to absorb in itself all the energy of attention. In such conditions we can scarcely be said to attend even to our own feelings, although—objectively considered, if this were possible—these feelings are the expres-

[1] Tonpsychologie, I., p. 68.

[2] For a popular account of the subject, see Ribot, The Psychology of Attention, chap. iii.; and for more thorough treatment, see the works cited there, p. 84.

sion of a supreme interest, for the time being, in some object or idea. In reality, however, the feeling has taken on the form of an emotion and so separated itself, in a measure, from the process of intellection which called it forth. Thus in excess of rage, terror, or grief, men seem completely to "forget themselves;" they scarcely any longer discriminate *as to what* they are angry at, afraid of, or sorrowing over. When, then, we say that a man attends to anything, the more he is interested in that thing, it is implied that the intensity of the excitement of feeling shall be kept below the highly emotional stage. Yet even in this stage we recognize the blindly groping, forced attention, which lies at the base of all mental life.

The character of any feeling, as respects its *tone* of pleasure or pain, influences the attention which it invites and secures. Other things being equal, the lower or more moderate degrees of pleasurable feeling fixate the attention; and with the growth of discrimination and self-control, they are likely to be intelligently and voluntarily attended to, and detained, retained, or reproduced in consciousness. With those feelings whose tone is one of pain, the opposite effect upon attention may be observed. They begin, to be sure, by withdrawing the attention of the mind from other objects and absorbing it in themselves; and if they are intense and persistent, through causes lying out of control, they retain attention with more or less of steady constraint. But with the growth of intelligence and self-control, the tendency is evoked by all painful feelings to withdraw attention from them; not to mind them but to think of and be interested in something else. This may be cultivated to the degree which is said to have distinguished the philosopher Kant, who habitually paid no attention to the painful feelings in his chest, although, whenever he did attend to them, he always found them there. Thus, on the one hand, we have frequent cases where emotional states of painful feeling overwhelm the soul and absorb its entire energy of attention. But, on the other hand, less frequent cases occur, where on account of the triumph of some conflicting state of emotion or the voluntary control of the mental train in obedience to ideal ends, attention is withdrawn from the most painful feelings and directed to external objects or to pleasure-bringing ideas. In this way not a few men have attended to work with scarcely diminished absorption in it because of forgotten painful feelings; hypnotic subjects habitually fail to feel the pains which it is suggested to them do not exist; warriors do not notice the wounds they receive in battle; and martyrs suffer burning, and at the same time exult in religious ecstasy. The physiological explanation of such phenomena undoubtedly suggests that, in these states, the functions of some of the central organs have been inhibited or temporarily paralyzed by excessive nerve-commotion in other central organs. But the full explanation demands that science should admit the truth which the popular language affirms, when it refers to the almost incalculably great and mysterious influence of attention over bodily pains.

The relation of attention to feeling is also dependent upon the general condition, as respects *freshness or exhaustion*, which characterizes every state of consciousness. The same thing is true of all the varying relations of attention, to intellection and conation as well as to feeling. But it is emphatically marked in the case of the feelings, because they "exhaust," as we say, the stores of nervous and psychic energy, with such rapidity. While

then a certain amount of excitement of feeling, by way of interest, freshens and assists the focusing of attention, whether spontaneous or voluntary, a larger amount of excitement, especially of the same feeling, exhausts the energy of attention. A mild unemotional interest, due to moderately pleasurable excitement of feeling, in the pursuit of ideals to which we have become habituated, and yet with the variety of aspect which such ideals and their pursuit admits—all this is most favorable to prolonged and effective exercise of the attention. But we are here far away from "primary" attention, although we still remain true to its fundamental laws.

The relation of Attention to the Conative aspect of all conscious activity has been much emphasized by modern writers on psychology. This has led certain English and German authors to treat of attention under the general heading of Will. In all "voluntary" attention, as the very term indicates, the factor of conation or volition is especially obvious. Ground for this opinion is found in the fact that *choice* enters into voluntary attention and determines within narrower or wider limits the direction which attention takes. But voluntary attention, like the most primary attention, cannot be exercised without a strict dependence upon intellection and feeling. In the wider use of the word "Will," we may say that all conscious distribution of attention, whether the change seems impulsive and forced or freely chosen, implies an act of will. In order, however, to avoid misunderstanding, we shall reserve this term for the higher manifestations of this universal aspect of mental life. The word "conation," or consciousness regarded in the aspect of spontaneous psychical activity, will better serve our present purpose. When, then, it is affirmed that all attention, even the most primary, is influenced by conation, it is meant that attention rises and falls, is distributed and redistributed, in constant dependence upon the varying amounts of psychical self-activity which characterize the different mental states.

For, from the most fundamental point of view, all psychic energy *is* self-activity; it appears in consciousness as the energizing, the conation, the striving, of the same being which comes to look upon itself as attracted to discriminate between this sensation and that, or compelled to feel some bodily pain, or solicited to consider some pleasant thought. This aspect of conation—the immediate awareness of being self-active—belongs to all passive or impulsive or forced mental states, as truly, though not in the same way, as to the so-called distinctively active and voluntary states. Expressed in popular and figurative language it may be said: if the attention is impelled or forced, still it is *my* attention; *I* yield to the impulse, *I* submit to the

force. And this psychical yielding or submission, especially when it is accompanied by the consciousness of *striving* to yield or not to yield, to submit or not to submit, is the conative or volitional aspect of all my mental life.

In that constant distribution and redistribution of attention which accompanies the changing states of consciousness, the amount of attention which every element and object secures is dependent upon its relation to the conative nature of mental life. The more intense, or interesting, or clearly discriminated, any element or object is, the more of psychic energy in attention does it ask for, and ordinarily get. But the striving to yield or not to yield attention, and even the so-called passive energizing of mind in attention—its degree and direction of conative energy—also determines the intensity, interest and discriminated quality of every element and object in every psychical state.

§ 17. The full significance of this way of regarding all *attention* as, in one aspect of the psychical life, *an act of will*, can only be seen after several important related topics have been carefully discussed. The English physiologist Foster has pertinently spoken of every amœba as having a "will of its own." The significance of this statement, however, depends upon whether we regard the amœba as *merely* an atomic mechanism, or not. Regarded as an atomic mechanism, the amœba is automatic; that is, the movements which it undergoes have, to the best of our knowledge, to be explained as arising not only reflexly in response to external stimuli, but at least partly from causes lying within. But if these automatic changes have *any really psychical correlate*, then doubtless the amœba has a "will of its own," in a new meaning of these words. The researches to which Binet and others make reference tend to show that "the psychic life of micro-organisms"[1] is indeed real and much richer and more varied than had formerly been supposed. However it may be with these minuter forms of animal life, we know that automatic (centrally originated) changes in the nervous mechanism of the higher animals have their psychical correlates. In general, psychical energizing—the self-active, conative aspect of consciousness—may be taken as such a distinctive correlate.

The meaning and importance of that very complex condition of our consciousness which is sometimes called the "feeling of effort," will become clearer in due time. Perhaps no form of attention is possible without admixture of this feeling; certainly, no prolonged and difficult focusing of attention is possible without involving much of this feeling. Inasmuch as part, at least, of this feeling of effort consists in sensations arising from the condition of tenseness or strain that has been produced by innervation of certain muscles through the act of attention, its connection with the conative aspect of all conscious attention is obvious.

It must be confessed that when we say all attention, regarded as conation, implies psychical activity spontaneously arising from the dark back-

[1] The Psychic Life of Micro-organisms, 1889.

ground of psychical life which we learn to regard as "ours," we have reached the utmost limits of our scientific explanation. We have simply come upon ultimate facts. On occasion of certain presentations of sense, or certain ideas, with an accompaniment of feeling, arising in consciousness, the same psychical being, whose the sensations, ideas, and feelings are said to be, also regards itself as active in selecting and appropriating these sensations, ideas, and feelings. Yet there are not two kinds of activity separable in time, and regarded as distinctly different forms of attention, involved in this. As we have already repeatedly said: Discriminating consciousness, feeling consciousness, conative consciousness, is one and the same state of consciousness, regarded in three aspects. And so we do not, as active beings, over and above our so-called passive or impulsive acts of attention, always will to attend to this rather than the other among the objects of consciousness. But *attention which, in its higher stages of growth, may reach the conditions necessary to intelligent, purposeful choice, is present as a blind striving and selective, but self-originating activity in all the lower forms of conscious life.* The fact that it is so is to be accepted as fact; it is ultimate fact, and can never be wholly explained by anything in the external conditions of such conscious life.

[Much the best brief treatises on attention to be found in English are the chapters on this subject in the works of Sully (The Human Mind, I., chap. vi.) and James (The Principles of Psychology, I., chap. xi.). Other works well worth consulting are Waits: Lehrbuch d. Psychologie, § 55. Volkmann: Lehrbuch d. Psychologie, II., § 114. Wundt: Physiolog. Psychologie, II., chaps. xv. and xvi. Stumpf: Tonpsychologie, II., p 280 f. And especially the monographs of G. E. Müller: Zur Theorie d. sinnlichen Aufmerksamkeit. Münsterberg: Beiträge zur experimental. Psychologie, i. Ribot: La Psychologie de l'Attention. Dohrn: Das Problem d. Aufmerksamkeit. Spitta: Die Willenbestimmungen, etc.]

Part Second

THE ELEMENTS OF MENTAL LIFE

Part Second

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CHAPTER VI

SENSATION: ITS NATURE AND CLASSES

DURING all the following discussion it must never for a moment be forgotten in what meaning, if at all, we can speak of psychical "elements;" whether the term be applied to the analysis of particular states of consciousness, or to the total complex evolution which we call our mental life. Such elements are never, of course, to be regarded as actually separable by analysis, either from each other or from the state in which they are said to exist. Neither are they capable of retention and future recombination, with other like or unlike elements, into a new mental state. No psychologist, whatever theory he may hold of the origin and development of mind, thinks of maintaining the separate reality of the factors of mental life.[1] That every field of consciousness, however varied its content, is nevertheless a unity which expresses each one of the three fundamental aspects of all psychic facts, has already been made sufficiently clear. But it has also been made just as clear that the distribution of discriminating attention, not only enables but even forces us to recognize a great variety of content, under each of these three fundamental aspects, as belonging to our conscious states. Regarded as subordinate partial processes, the varying contents may be recognized by introspective analysis, as they unite in the general process of mental life—contributors in their own way to determine the total complexion of the stream of consciousness. The reality is this onflowing stream of consciousness in which

[1] Professor James (see especially, I., chap. vi., and *passim*) is scarcely justified in arguing *as though* the explanation of complex mental states by fusion and synthesis of more elementary psychoses were not warranted, because he is able to criticise Mr. Spencer and others who have been quite too careless in speaking *as though* they regarded these elementary psychoses as being themselves entities like atoms.

there are changes of function, but no stationary and finished products. As entering into and constituting this stream, the subordinate partial processes may be called the "elements of mental life." Indeed, it is only by employing this analytic manner of study that we can frame any science of psychology at all.

But even those partial processes, which introspection easily detects by focusing attention upon them, cannot confidently be spoken of as "ultimate" elements. However, experiment and growing skill in analysis come to our assistance, and thus we may find our way nearer to what appears to be "ultimate." The overtones, for example, when once made by skilled analytic attention *to come forth from* the compound note in whose timbre they unite, can then be heard *in the same note* when it is reproduced. Again, the particular tactual and organic sensations which fuse with others—retaining their characteristic quality only in a dim, obscure way—in the production of a general condition of *malaise*, when once recognized appear as definitely localized painful feelings—like noteworthy waves in the sea of our discomfort. Yet again, it is only when we think what we are thinking about, that the particular objects and processes going to make up our line of thought, stand out as factors in its composition. We can, therefore, talk and argue about the *absolutely* simple elements of mental life; but we can never be sure that we have isolated and envisaged any such element in the stream of consciousness.

I shall never discover myself having a sensation of blue, for example, that has no extension or locality, that is not the blueness of some surface spread out somewhere, as seen or imagined in space. But I may discuss the sensation of blue, simply as this and no other sensation, and as abstracted in thought from all seen or imagined extension. I shall never discover myself thinking, without also feeling and willing in the same unity of the conscious mental life. But I may consider what it is to think, without taking into account what it is to feel or will; what it is to think as related to different changing phases of feeling or will. I may even abstract from the consideration of the thinking process all that seems to be the result of a development of the thinking function; and so, although I can neither actually catch myself, or imagine myself, as exercising this thinking function in a manner not implying development, I may discuss the nature of undeveloped or primary intellection.

To this general explanation of what is properly meant by the "elements of mental life" the particular explanations belonging to the different classes of elements will appear in their appropri-

ate places. The warning not to mistake the meaning of the terms used need not be further dwelt upon here.

We dismiss this subject for the present after emphasizing the following two remarks: (1) The words "elements," "factors," "fusion of factors" (or elements), etc., as employed in psychological science, do not indicate the same things in reality as do the same words when employed by physical science; *they are figurative, and are designed to characterize the complex content of consciousness,—objectively regarded, as it were.* But (2) *every state of consciousness has also its active aspect.* It *is* a complex *psychic activity;* and in characterizing this aspect, we may, with equal truthfulness to reality and less figuratively, speak of "mental activities," as more or less elementary or complex, or of "the distinguishable but irresolvable modes of mental life," instead of speaking of "elements," "factors," "fusion of elements," etc.

§ 1. Our conception of what is meant by a simple or uncompounded element of mental life may be further illustrated, in the case of the sensations, by taking some suitable instance and performing the required analysis. For example, when we close our eyes and allow the after-images of what we have just been looking at to die wholly away, we have before us a sort of light- and color-mass, composed of rapidly shifting factors and having only a vague, indefinite outline of extension. Let us now keep the eyes motionless, and abstracting attention from the other parts of the field, fixate it upon some portion of this "mass" which happens for the moment to have a similar color—*e.g.*, the pinkish or purplish center of the field. We shall never see this color otherwise than as "spread over" this portion of the field; as a *quality*—that is to say—*belonging to* the extended color-mass. Moreover, if we focus discriminating attention upon some minuter subdivision of the central field, we shall see it break up into smaller and yet smaller subdivisions which differ, not only in their locality as points within the field, but also in the precise color which they have as compared with other contiguous points. Abstracting again our attention from the relations of locality and similarity or dissimilarity of color-tone, we may focus attention upon what some one of these minutest discernible factors of the color-mass is, considered not as a local point in the whole extended surface, but as an affection of our consciousness—what it is in itself as a simple and purely subjective modification. Thus regarded, it may be said to be as near as we can come to an introspective analysis of the simple sensations of color, regarded as factors, or elements, of complex psychical states.

And now we may summon all the resources of modern psycho-physical science to tell us under precisely what conditions of physical stimulus (wave-lengths of light), irritation of the retina, photo-chemical changes in the pigments, activity of the rods and cones, of the optic nerve and optic tracts, of the appropriate regions of the brain, etc., this particular form of subjective modification takes place, We may also discover under what conditions it fuses with other colors; by what stages, and according to what laws, it and

they all come to be regarded, not as subjective modifications but as qualities of things; and, finally, what are the more general relations under which the entire experience of light- and color-sensation stands to our experience through the other senses, and to the total development of mental life. Thus does science make use of what it has obtained by pressing its analysis to the furthest possible limit, in order to discharge its duty as science in the *explanation* of the genesis and evolution of states of consciousness.

This illustration, taken from one form of sensation, involves nothing peculiar to the particular class of sensations from which it is taken. For every "state of consciousness, as such," comes before us with the claim to be investigated as resulting from the synthesis, or fusion, of an indefinite number of the primary elements of all mental life.

It follows from what has just been said that a *Simple Sensation is a convenient abstraction of psychological science.* It is one of those theoretical factors into which analysis—partly by introspection, but chiefly by experiment and abstract reasoning—breaks up the complexes which have the predominating characteristics of all our sense-experience. The reality which corresponds to the term differs from the somewhat similar fiction (the so-called "atoms,") of physical science. The reality in the case of psychological analysis is not an assumed entity; it is a partial, and oftentimes it may be, a very obscure or sub-conscious process, which has its being only in the temporary contribution which it makes, as such process, to the total complexion of the stream of consciousness. Those processes of our sense-experience which we are unable in any way to regard as composite, or as analyzable into still more nearly ultimate factors, we are entitled to call "simple sensations." About them as such, psychological investigation raises certain inquiries as to their nature, classification, organic and physical pre-conditions, specific qualities, changing quantity, and fitness to be objectified as sensible properties of things.

The Nature of Sensation must invariably be considered by psychology from its own independent point of view. For this science—we have seen—takes account of sense-experience only as it consists of states of consciousness, to be described and explained, *as such.* Only psychic factors can enter into psychic states. Only mental processes can be regarded as constituent elements of the stream of conscious life. It follows, then, that not only the external physical stimuli which act upon the organs of sense, and the elaboration of such stimuli by these organs, but also the nerve-processes in the organs, must all be regarded as alike the physical preconditions of sensation. The *sensations* arise only in the purely psychical realm, as modifications of the

stream of consciousness. They neither *are*, nor *are like*, the stimuli or the resulting nerve-commotions which form the ordinary physical pre-condition of their origin. It is, therefore, not only impertinent but even absurd, from the psychologist's point of view, to speak of sensations as "propagated" from the peripheral organs to the brain, or as "elaborated" in either the lower or the higher regions of the latter organ. The essential nature of sensation is understood only when we make clear to ourselves that it is *not* a physical or physiological process.

Further, sensations are not regarded by psychology as properties or qualities of extra-mental and extended things. How they stand related to objects of perception—to sensible, perceived things—it is the business of psychological investigation to discover. But, as psychology regards them, sensations are in, and of, the conscious mental life of the perceiver; they are *not* qualities of things, regarded as physics and chemistry regard things, in their being as extended and external, or out of the perceiving mind. For this reason it is that psychology has constantly to contend for its points of view, both against those who would identify nervous processes with psychical processes, and also against those who would identify the sense-experience of mind with the properties of extra-mental realities. The psychological point of view differs both from that of physical science and from that of so-called "common sense."

In all conception of the nature of sensation, from the psychological point of view, we are obliged then to make an appeal, either direct or indirect, to consciousness. This appeal takes us in two directions, according as we emphasize the well-known conditions under which our sense-experience ordinarily originates; or, on the other hand, emphasize the part which such sense-experience plays in the development of knowledge. Proceeding in the former direction we may say: *A sensation is that peculiar modification of consciousness which is ordinarily developed on occasion of the excitement of some organ of sense by the action upon it of external stimuli.* And here, what the peculiar modification of consciousness is—the psychic fact, "as such"—can be known only by a direct appeal to consciousness. But if we proceed in the direction of the relation which our sense-experience sustains to our knowledge of things, we may say, *sensations are those peculiar modifications of our consciousness by which the nature of sensible objects is made known to us.* Subjectively considered, my sensations are *mine*, affections of my mind as truly as are my feelings of grief, desire, weariness, or of patriotism, benevolence, malevolence, and the like. Subjectively considered, their pecul-

iarity consists in their dependence, as forth-puttings of mind, upon the activity of certain bodily organs; this view, in its turn, emphasizes the passivity of the sensation-processes. Objectively considered, the sensations are markedly unlike my feelings of grief or of patriotism; objectively considered, they are potential factors of all presentations of sense—elements of mental life, to be sure, which become objectified, as my feelings and thoughts cannot, in the form of qualities of perceived *things*.

§ 2. No explanation or remonstrance can make the habit of confusing the psycho-physical conditions of sensation with the *being* or *nature of sensation* more inappropriate than it appears at first glance. This remark applies in criticism not only to those who, like Claude Bernard and Lewes, speak of the contraction of living tissue as a "sentient" process; or like Dr. Maudsley and Comte identify physiology and psychology throughout; or, like M. Gerdy define sensation as "the change that takes place in the organ affected under the influence of an excitation." It applies almost equally to those who, like Mr. Spencer, rely for their explanation and description of the simpler recognizable sensations, upon the "aggregation" and "agglomeration" of "nervous shocks," after the fashion of the combination of material atoms into molecules, etc. It must be distinctly understood that whenever we speak of the "fusion" of sensations in "sensation-complexes," we speak of purely psychical processes, resembling in quality known phases of actual states of consciousness. In other words, the terms are psychological and refer to relations accomplished in the stream of consciousness, and not in the physical substratum by "overlappings" of central nerve-commotions, and the like.

Far less reprehensible is the point of view taken by writers like Volkmann. This author (L, § 82) regards sensation as a state developed by the soul (a forth-putting of soul) in reaction upon entering into relation with some form of external being—the so-called stimulus. This conception of sensation assumes, to be sure, the existence of the soul as a real being capable of entering upon its own place and doing its own work, as it were, in the world of real beings. On account of its quasi-metaphysical implications we prefer not to introduce it in discussions that belong to scientific psychology. But in so far as the conception insists upon the *purely psychical* nature of sensation, it is indispensable to the point of view demanded by psychological science. We agree with this author in regarding sensation as a mental process, which is not to be identified with the correlated process in the nerve-fibers. And if we raise the question whether it is to be considered as activity or passivity, the answer may be given in either way according to our point of view.

Few words are used in a more confused and vacillating manner by psychologists than the word "sensation." The further explanations necessary to define our use, and to make clear the distinction between sensation and sensuous feeling, or between sensation and sensuous cognition, etc., must await their proper time.

§ 3. The twofold reference of every sensation — as a state induced in us

by the action of stimuli upon the organs of sense, and also as an item of information concerning the quality belonging to the object of sense—must be recognized by all psychological theory. Thus, as Rabier says:[1] "It has been customary to understand by *sensation* the *tout ensemble* of psychical phenomena (representative or affective, with little or no distinction) which results *immediately* from an impression made upon the organs of sense." And a German writer,[2] who sets out to establish a new doctrine of mind upon a physiological basis, reminds us that sensation is "no mere passivity, but a reacting impulse." Still another author,[3] after incautiously defining sensation as "the becoming-conscious" of organic impression, goes on to say that this becoming-conscious itself presupposes that the organic impression arouses or solicits the soul to activity. "This arousement of the *Psyche* it is which we designate as sensation."

By our recognition of both the passive and the active side of every process of sensation we get a completer view of the nature of all sensation. Every sensation is a psychical act, conditioned upon the senses being affected by external stimuli in a particular way. Thus, though we are active in having the sensation, and the sensation is, in its essential nature, a psychical activity, it is also of the nature of an "impression" made upon us through changes in that which is not our activity. This twofold nature—this capacity to be regarded either as an impression received from without, or as a peculiar activity arising from within—belongs to all our sense-experience.

§ 4. It is by no means without significance that sensations have been described as those peculiar modifications of consciousness which are "*ordinarily*" developed in dependence upon the excitement of the end-organs of sense by external stimuli. Further detailed investigation shows that the appropriate excitement of the central organs is the real and final physiological precondition of sensation. For if the sensory tracts lying between the organs of sense and the brain are impaired, no psychical impression is made, no psychical activity arises corresponding to the peculiar function of the organs of sense. The excited eye cannot arouse the sensations of color, unless the optic tracts are entire; the irritated ear causes no sensations of sound, unless the auditory tracts are capable of action. Moreover, experiments in extirpation upon the brains of the lower animals, and observation of the effects of disease in man, show that to disturb or to destroy certain cerebral centers is to disturb or to destroy the capacity for certain classes of sensations. Still further the excitement of the brain by internal stimuli —as alcohol, narcotic drugs, etc., or the changed character of the blood through the decomposition-products of fever—results in hallucinations; but hallucinations are sensation-states having, wholly or in part, the "objectivity" ordinarily obtained only by irritation of the end-organs of sense by external stimuli. And, finally, in certain dreams and other vivid activity of the image-making faculty, all discernible distinction disappears between sensations peripherally excited and mental images originating in internal stimulation. Indeed, the very boundaries between sense and memory and memory and imagination will be seen to be shifting and stretched over debatable ground.

[1] Leçons, etc. I. Psychologie, p. 91 f. [2] Horwicz: Psychologische Analysen, i, p. 305 f.
[3] Kaulich: Handbuch d. Psychologie, p. 20 f.

A preliminary, gross Classification of the Sensations may best be made on the basis of the particular organs in whose activity those nerve-processes originate which furnish the ordinary physical conditions of sensation. Hence the popular classification leading to the *five senses* of smell, taste, hearing, sight, and touch —or sensations of the nose, mouth, ear, eye, and skin (especially of the hand in active touch). Even in such imperfect and preliminary classification, however, two things of importance must be recognized. First, the combined activity of several of these organs results in the simultaneous production of several kinds of sensation which fuse together in the total result ascribed to each organ. This is always the case with two or more organs whose activity is excited in close local or temporal connection. For example, a large part of the "taste" of sapid substances received into the mouth is really smell (is due to activity of the adjoining nasal organ); and in many instances, tactual and muscular sensations form no unimportant factor of our "sensation-complexes" referred to taste. In particular what we see, regarded merely as sensations received through activity of the eye, is far more than mere light and color. Here again, tactual and muscular sensations blend with those sensations which are more obviously ascribed to the visual organ. But, second, modern psychology—especially in the interests of a satisfactory theory of perception by the senses—finds it necessary to extend the popular classification, even while keeping it upon a similar basis. This is done by recognizing fundamental distinctions in the sensations ascribed to the skin; and also by adding at least two other classes of sensations orginating in activity of organs not recognized by the popular division. Thus we have sensations of temperature, of the muscles, and of the joints.

The Causes of the different Classes of Sensations, so far as we can discover them at all, are partly physical and physiological, partly psychical. So far as they belong to the former order they are (1) the physical constitution of the organ, which enables it to transmit and modify appropriately some particular kind of physical stimulus (light, sound, heat, mechanical pressure, chemical changes, etc.); (2) the histological structure and peculiar physiological function of the truly nervous parts of the peripheral organ—which parts receive the modified stimulus and convert it into a nervous process, a *nerve-commotion*, that originates in the end-organs and is capable of propagation along the nerve-tracts to the central organs; and (3) the histological structure and peculiar physiological function of the central organs, which receive the incoming nerve-processes and pro-

foundly modify them, by central processes of elaborating, inhibiting, combining, adjusting, etc. It is, then, as has already been intimated, to the differing processes in the brain that we must look for the *final* physiological explanation of the different kinds of sensation.

The psychical causes of the different kinds of sensation are to be found in mental habit, varying distribution of attention, acuteness of the power of discriminating judgment, etc. But below and behind all kinds of explanations stands the unexplained. In our attempts to give causes for the different kinds of sensations we soon came upon ultimate facts, for which no cause can be given. It is a fact that when certain nerve-processes, the nature of which we can guess at with more or less confidence, take place in the brain center X, the sensations $S(A)$, which we call "auditory," arise in consciousness and run through a series of changes, such as $S(A)$,[1] S (A)[2] S (A),[3] etc. It is also a fact that when other, presumably different, nerve-processes arise in another brain-center Y, the totally different sensations $S(V)$, which we call "visual," arise in consciousness and run through a series of changes, such as $S(V)\alpha$, $S(V)\beta$, $S(V)\gamma$, etc. But why nerve-processes of the order X, in one cerebral center, should give rise to the kind of sensations, $S(A)$, and its peculiar series, and nerve-processes of the order Y, in another cerebral center, should give rise to another kind of sensation, $S(V)$, and its peculiar series; why also cerebral processes should give rise to psychical processes of sensation, at all—these are questions about the answer to which we, at present, know nothing whatever; nor does it seem in the least degree likely that we shall ever know the answers to questions like these.

§ 5. It should be understood in this connection, in a preliminary way, that the different sensations stand in very different relations to the development of sensation-experience. In the origin and growth of this form of mental life, the tactual and muscular sensations are fundamental and universally present. Biology is accustomed to refer this fact to the character of the evolution of animal species. And certain it is that some kind of sensitive integument responding to external stimuli (an *ectosarc*, or rudimentary skin) belongs to the very lowest kinds of animal and psychical life. In that line of development in which man belongs, a muscular system, under the responsive control of will and by its activity completing the triple action of the reflex mechanism, seems equally indispensable. Presumably, the human embryo begins its conscious life, its first rudimentary organization of sense-experience, upon a basis of tactual and muscular sensations only. That tactual and muscular sensations are evoked by the activity of all the organs of sense, and that they enter, in an important way, into the complex

resultant of the activity of these organs, will be made perfectly clear by subsequent discussion of the origin and development of perceptive faculty.

§ 6. In the case of man, and of all highly organized animals, the greater bulk of the end-organs of sense—especially of the eye and ear—has a mechanical significance only. That is to say, the sense-organ is chiefly an ingenious contrivance for modifying the external stimulus, and for conveying it to the nerve-elements in such manner as to excite them to their peculiar nervous function. Biologically considered, the end-organs (*epidermis* and most important parts of the special organs of sense) develop from the same embryonic layer ("epiblast") from which come the central organs of the nervous system. With respect to its minute structure and function, every organ of sense may be considered as a special modification of the superficial cells, adapting them to the different kinds of stimuli. Every such organ, therefore, looks both outward and inward; it is a "mediator" between the nerve-commotion of the nervous system and the various forms of physical energy which are to be adapted so as to excite this system.

§ 7. It may be assumed that the nerve-tracts, which lie on the way to the higher central organs, do not modify the nature of the nerve-process which gives rise to sensations. But what is called the "localization of cerebral function" has shown that the different areas of the brain have different relations to the different kinds of our sensation-experience. For example, the "optic thalami" in the lower regions of the brain, and the "superior occipital convolutions" in the cerebral hemispheres, sustain a peculiar relation to the origin and development of visual sensations. Physiological science is beginning to connect different portions of the general visual brain-area with particular portions of the retinal field. We know also what regions of the hemispheres—namely, those about the "Fissure of Sylvius"—are chiefly concerned in the elaboration of impressions that give rise to the sensations of hearing. Nay, more, this science differences the psychical functions employed in the utterance or interpretation of thought as expressed in language, and "locates" the areas chiefly concerned in each of these different psychical functions. Sensations of touch, taste, smell, and temperature, are also—though, as yet, with less of certainty and exactness—being "localized." This is all to be understood simply as pointing out those particular regions of the brain where the physiological pre-conditions or causes of the different sensation-processes are fulfilled. Sensations themselves remain as truly psychical and distinguishable, in kind, only by a process of pure introspection as they ever were.

Meantime, inquiry goes on as to *the peculiar nature* of those processes in which the "physical basis" of the different kinds of sensation is, as it were, laid. But here the results of experimentation, observation, and application of general biological facts to the particular case of the human brain, have resulted in little really scientific information. We know far better than we knew twenty years ago *where* in the different regions of the brain, some peculiar process called a "nerve-commotion" takes place when each of the different main classes of sensations "occupies" the field of consciousness. But we know scarcely any better than we did twenty years ago *precisely what* takes place in the different brain-areas, and forms the common basis for our sensation-experience. We do not know at all in what respect the nerve-proc-

esses corresponding to sensations of color differ from those corresponding to sensations of sound.[1]

§ 8. The realm of the unexplained, the realm of mystery consisting in actual and acknowledged fact, spreads widely over this whole subject of investigation. The reasons why *my central nervous system* should be excited, through the end-organs of sense, by acoustic waves lying within a certain range, and not by those lying beyond this range, by vibrations of luminiferous ether so many billions to the second, and not by a smaller or greater number of vibrations, by effluvia of a certain unknown constitution, and not by others of a different constitution, etc., are doubtless to be found in the molecular structure of the nervous organism itself. But why *I* should respond in one instance with the sensation of red, in another with the sensation of yellow, etc.; or now with a sensation of $a\flat$, and now with a sensation of $c\#$; or should put forth the sensation called "smell of a rose" when I hold in my hand one flower, and "smell of a heliotrope" when I approach another flower—all this must be accepted as inexplicable matter of fact. Nor do the attempts thus far made to reduce these facts to any system under the terms of "mechanics of the sensations" seem at all likely to succeed.[2]

Sensations of Smell are those peculiar modifications of consciousness which are the characteristic result of exciting the end-organs of the nose. In general, bodies which excite these sensations must give off some form of effluvia or odorous reek. The stimulus of the organs is then applied as it is borne to them in gaseous form—usually the current of air—and is made with more or less force to pass over them, almost exclusively in the act of inspiration. Smells are generally said to be "unclassifiable"; that is to say, each smellable object has its own peculiar smell, and consequently we can only describe the smell by reference to the object. We cannot "sort out" smells into classes, as we can colors into red, green, blue, and the like. Recent investigations point in the direction of a possible classification of smells on the basis of the chemical constitution of the objects occasioning them. It must be remembered, however, that even thus we should not classify the sensations, "as such." No symbolism, such as that of the line, the triangle, etc., is applicable to the sensations of this sense. In all our actual experience, however, the sensations of smell—and especially when they are at all intense—are fused with more or less wide-spreading tactual, muscular, and organic sensations—the latter often reaching well down the digestive canal.

§ 9. More precisely the end-organs of smell are certain nervous structures scattered over the mucous membrane in the upper region of the nasal

[1] On all these and other connected subjects, see the author's Elements of Physiological Psychology, pp. 1–302.

[2] Comp. Medem's Grundzüge einer exacten Psychologie, I., Die Mechanik der Empfindungen.

cavity (the *regio olfactoria*). Here the effluvia contained in the inspired current of air are forced against the processes of the olfactory cells and start in them the nerve-commotion which is propagated along the olfactory tracts to the appropriate lobes of the brain. That fluids applied immediately to the olfactory regions cannot be smelled has been asserted, but is probably not strictly true. Gold fish, it is said, will not touch eggs when saturated with olive-oil or asafœtida.[1] It is doubtful whether these sensations, proper, can be excited by electrical stimulation. Subjective sensations of smell—sometimes symptomatic of oncoming insanity—are possible; and inability to smell may be due either to the condition of the end-organ (as in the well-known case of "loss of smell," with a "cold"), or to atrophy of the connecting nerves and brain-center.[2]

Since the interesting discovery of Romieu, in 1756, that very small bits of camphor on the surface of water have a curious rotary motion, the same phenomenon has been noticed by a number of observers in several hundred odorous substances of either vegetable or animal structure. This, of course, strengthens the belief that the stimulus of smell is thrown off from these substances in the form of invisible and imponderable particles. If paper be tied in front of the nostrils of dogs, they cannot "track" game or follow their masters by the sense of smell.

The difficulty of classifying smells, chemically, is enhanced by the fact that chemists differ much concerning the smell of the same substances. Moreover, only a few of the elements have any characteristic smell; and, perhaps, not these when in a perfectly pure state. It is said that artificial perfumes are, in general, binary and tertiary compounds, in which the number of the equivalents of hydrogen diminishes in relation to the number of equivalents of carbon.[3] Products less rich in hydrogen form an "aromatic series." On the other hand, substances not analogous in chemical composition are sometimes alike in smell. Thus, vapor of arsenic smells like garlic; and triturated emeralds, rubies, and pearls, give off an odor of violets.

In general, this lowest, most animal, least intellectual of the sensations is peculiarly baffling of all attempts to reduce it to terms of science. In the developed and cultivated human species, smell has come to be, for the most part, of the nature of an æsthetical advantage or affliction, rather than a means of accurate knowledge. But in the lower and less cultivated phases of animal life it, by the prompt and accurate information it furnishes, serves as a most important factor in the preservation, propagation, and evolution of the individual and of the species.

Our scientific knowledge of Sensations of Taste is somewhat more capable of being satisfactorily exhibited than that of the olfactory sensations. The organ by whose activity these sensations are occasioned is the tongue and—at least in some cases—the anterior portions of the soft palate. In general, only fluid

[1] See the grounds on which Aronsohn disputes the accepted conclusions of Weber and others. Archiv f. Anat. u. Physiol., 1886, pp. 321–57.

[2] See Dr. Donaldson, on the brain of Laura Bridgman, reprinted from the American Journal of Psychology.

[3] See M. Henry: Les Odeurs, etc. Paris, 1892.

bodies, or such as are to some degree soluble, excite the end-organs of taste. All gustatory sensations are, on account of the very organic activity on which they are dependent, connected with sensations of smell, touch, muscular sensations, and organic sensations arising from irritation of different depths of the digestive canal. The application of the gustatory stimulus is ordinarily made by pressing it against the end-organs, after it has been rendered fluid in the saliva or in some other menstruum. What it is in tastable substances which enables them to excite the different kinds of tastes is quite unknown; investigation, however, seems to point in the direction of connecting their gustatory character with their chemical constitution.

The four principal kinds of taste usually recognized are the sweet, the bitter, the salt, and the sour. To these Wundt would add the alkaline and the metallic. There can be no doubt that all the "tastes" of gustable substances with which our daily experience makes us familiar are compounds; many of these compounds may be regarded as resolvable into these six so-called simple tastes. The peculiar "shading" of sensation which a large number of substances produce, when introduced into the mouth, is due to the smell they excite. Yet we agree with those who deny that all kinds of taste, even after abstracting the sensations of smell with which they are fused, can be brought under these six classes. The number of kinds of taste is thus somewhat indefinite; although gustatory sensations lend themselves to classification much better than do the kindred sensations of smell.

§ 10. The special end-organs of taste are certain "gustatory flasks" or "bulbs" contained in *papillæ* that are scattered over the regions already mentioned.[1] Gustable substances when brought near these papillæ excite secretion of the glands which serves for continual cleansing of the papillæ and for washing away the dissolved substances. The question whether tastable substances excite the same sensations when applied to different parts of the tongue has been made a subject of much experiment; it is a difficult question to answer satisfactorily. Many seem to taste sweet and sour chiefly with the tip of the tongue, bitter and alkaline with its roots.[2] A certain derivative of saccharine was found to produce sensations of bitter when applied to the back part of the tongue, and of sweet when applied to the tip and borders of the anterior half.[3]

[1] The Transactions of the Academy of Sciences at Cracow, 1888 (see Centralblatt f. Physiol. No. 19) report that a patient, whose whole tongue had been removed, retained some taste caused by touching the back of the throat or the mucus of the stump.

[2] See, however, Rittmeyer's experiments (Geschmacksprüfungen, Göttingen, 1885), which concluded that the root loses its perception of taste least readily under drugs, and retains the power to taste bitter best of all.

[3] Studies from the Biological Laboratory of Johns Hopkins University, June, 1887.

Some experimenters have claimed that they could taste perfectly dry gases; or that mechanical excitation by rubbing, pressing, or pricking, excited gustatory sensations. Both claims are doubtful. On the other hand, electrical stimulation of the different areas of the tongue does seem to cause sensations of taste. It has been claimed by Haycraft (*Brain*, July, 1887) that tastable bodies are surrounded by an atmosphere, as it were, of vibrating matter; and that the peculiar character of the sensation aroused depends upon the pitch and complexity of these vibrations. Moreover, all the soluble chlorides are said to have a salt-like taste; and this becomes more saline and develops into a bitter with the higher members of the group. But the carbon compounds have in general an acid taste; and many sweet substances are alcoholic bodies and contain the radical CH_2OH. Hence we are led to the theory that similar sapid compounds vibrate in similar complex ways, and thus occasion similar sensation-complexes of taste. About all this, however, we are still much in the dark.

§ 11. It is altogether too customary with psychologists to assume that all sensations of taste may be regarded as resultants of the fusion of a few kinds of sensation of this sense with one another and with the indefinite kinds of sensation belonging under the sense of smell. On the contrary, Horwicz[1] holds that a large number of gustatory sensations—for example, like the taste of meat, milk, coffee, etc.—cannot be explained in this way. In this opinion we believe him to be correct, as against the somewhat widely accepted classification of other psychologists.

Sensations of Sound are those peculiar modifications of our sense-consciousness which arise when the auditory nerve is irritated through acoustic waves striking upon the ear. This whole organ is composed of three easily distinguishable parts, which are called respectively, the outer, the middle, and the inner ear. All of the two former, and a large part of the latter portions of the auditory organ are serviceable only in a mechanical way. They serve, that is, to transmit the acoustic excitement while reducing it from waves in the air, which have a small intensity and a great amplitude, to waves in the fluids of the inner ear, which have a comparatively high intensity but exceedingly small amplitude. The inner ear in which the specific end-organs of sound are situated, is a very minute structure, but even more complicated and wonderful than the eye. Besides those sensations which originate in stimulus from the surrounding air, "entotic" sounds are by no means infrequent. These are due to changes going on within our own body, vibrations from which are propagated to the end-organs of the inner ear, for the most part through the middle ear. Among them may be instanced the sound of the beating of the heart, the crackling noise sometimes produced by yawning, the ringing in the ears when we

[1] Psychologische Analysen, III., p. 94 f.

have taken quinine, the soft murmur of our own respiration, or the low musical tone heard when we press our fingers in our ears and set the muscles of the jaws to vibrating intensely.

All sounds may be divided into two classes—*tones*, or musical sounds, and *noises*. The two are, indeed, apt to be blended in all our ordinary experience with sounds. Few players, if any, on the violin produce a perfectly pure note, free from all admixture of scraping noise; and we are all familiar with the fact that the ax "rings" in a semi-musical way, when it strikes the tree, and even the slamming door awakens and absorbs musical tones. The question, whether one part of the inner ear (the "vestibule") is the specific organ of noise, and another part (the "cochlea") the specific organ of musical tones, was for some time answered affirmatively. And there is much in the structure of the two, especially of the cochlea with its obvious arrangements for accurate analysis and for a "scale" of sensations, which favors this view. Since, however, we can get musical tones by repeating noises,—*e.g.*, exploding soap-bubbles of hydrogen, or forcing a stopper out of lead pipes of different lengths, etc.—some investigators have recently been led to argue that we hear tones and noises with the same organ.[1] Moreover, a series of short, sharp noises like a watchman's rattle can be made as many as six hundred times a second, without producing a note, if only all extra accompanying sounds are dampened. The two classes of sounds can thus be made to pass into each other by insensible gradations.

The musical sounds of our ordinary experience are themselves compound—"sensation-complexes" resulting from a fusion of simple sensations in such a manner as to be indistinguishable without specially trained powers of analysis. They are termed "clangs" by the German psychologists. They have the quality called "pitch," and are capable of being arranged in a scale, according to the character of a so-called "fundamental" tone, the lower (in the scale) and stronger one of the sensations of musical sound which are fused in each particular "clang." They are also said to have "timbre," which is the peculiar mixture of quality dependent upon the number, relative intensity, and pitch of simple tones which fuse in the compound tone. It is by its timbre that the note a^1, when sounded on the piano, differs from the same note when sounded on the violin or by some human voice.

The pitch of tones depends upon the rapidity of the periodic

[1] So Exner concluded in 1876, and Brücke has recently confirmed the view. (See Wien. Sitzgsbr., 3d Abth., 1884.)

vibrations (the number in a given unit of time) which occasions them; or—what is the same thing—upon the length of their acoustic waves. Objectively considered, tones and noises differ in that the former result from a periodic regularity of stimulation; while such periodicity is wanting to the stimulation which occasions sensations of noise. Subjectively considered, the peculiar quality of tones is in the pleasant modification of consciousness connected with the variations in their pitch and timbre. The sub-classes of tones are derived from this quality of timbre which all musical clangs possess; and it is the possession of this quality which makes it possible to arrange the tones in musical "scales" where each tone has its appropriate place relative to other contiguous or remote tones. But noises, considered apart from the tones which blend with them, lack this peculiar pleasant feeling; cannot be arranged in scales according to timbre but only according to intensity; and must be classified, if at all, as "crashing," "crackling," "hissing," or those very disagreeable "beats" which disturb the purity of musical tones.

§ 12. The *inner ear*, to which the branches of the auditory nerve are distributed and in which the nervous end-organs of hearing are situated, consists of two portions (the "cochlea" and the "vestibule," with the latter of which the "semicircular canals" may be considered as one). The general problem which this organ has to solve may be said to be a "problem in analysis." In that most complicated portion of the cochlea, called the "organ of Corti," some three thousand fibers are arranged in rows upon a membrane, somewhat like the keys of a piano-forte. Now if these are distributed over seven octaves we have about thirty-three for each semitone. Helmholtz, therefore, suggested that these rods are the organs of musical sound. But the "rods of Corti" do not seem well adapted to vibrate; and birds which do not have them, are capable of appreciating musical tones. Hensen has shown that the membrane (called "basilar") on which the rods are set is itself graded to pitch; its individual radii may therefore act like stretched strings to respond to the different tones, from the lowest to the highest. Still more recent investigations [1] have led to the view that certain exceedingly minute arches, in the organ of Corti, which at the base of the cochlea are small and little spread, and at the upper end are larger and much spread, vibrate to the strings of the membrane, like the sounding-board of a piano to its different strings. What is certain is that the cochlea is equipped with a mechanism for analysis, although the precise action of this mechanism is not yet perfectly understood. Still further, since we can hear some five hundred or more times in a second (the crackle of electric sparks with an interval of 2 σ), an apparatus for promptly "damping" the sound must be provided in the ear.

§ 13. The sub-classification of musical sounds, or the arrangement of the

[1] See the researches of Dr. C. Brückner, Virchow's Archiv, cxiv., Heft 2.

great variety of tones discernibly different as respects quality, requires, of course, more or less of trained appreciation of differences and habitual exercise of the power of discrimination upon one general form of sense-experience. It is matter of fact, however, that all adults who are not tone-deaf seem to have some power of judging differences of quality in pitch, purely as such. The number of qualitatively unlike sensations of musical sound of which each individual is capable is determined by this power. Such judgment is, without doubt, ordinarily much assisted by an appeal to other sensations—muscular, tactual, even visual—which blend in our sense-experience with sensations of musical sound. We imagine how we should sound the note by lifting up or depressing the larynx and other organs of vocalization. But even Jenny Lind could with difficulty sing in quarter tones; while ordinary discrimination of kinds of pitch and timbre goes further than this, and the discrimination of trained musicians far exceeds these limits. Here, as in all similar cases, the general principle is: *Sensations cannot be discriminated as different which have not been heard as different.*

The natural way to arrange a so-called "musical scale" is as follows: Given two tones, as *m* and *n*, which are separated by a plainly discernible interval (that is, are known to be considerably unlike in kind), one is required to put another tone in between them. Between this newly placed tone—we will say, *m'* or *n'*—and either *m* or *n*, one is now required to place another tone discernibly different in kind; and so on until a limit is reached. This natural and inevitable way of arranging our sensations of musical sound may be pictorially represented by different positions, assigned to the different so-called "notes," along an uninterrupted straight line; or—as in writing music—on and between the "bars" of modern musical symbolism. Unlike our experience with colors, we find in musical sounds only one way of getting at the position of any particular member of the scale; that is, we must slide along in the one direction of the scale. Whereas there are two ways of going from blue to yellow (*i.e.*, through blue-green and green, or through violet, red, and orange), there is only one way of going from *a'* to *a''*, or from *c♯* to *b♭* in the same octave. We speak then, in some sort according to their very nature, when we regard our various kinds of sensations of tone as constituting a series, constant and yet indefinite, as respects both its upper and its lower limits, and also as respects the differences discernible by different individuals between the contiguous members of the series.

Sensations of Light and Color are the characteristic modifications of consciousness occasioned by stimulating the expansion of the optic nerve within the ball of the eye. The organ of vision is itself largely a mechanical contrivance adapted to transmit and modify the waves of light so that they may serve as proper excitants of the true nervous end-organs of sight. The primary problem for this organ is the formation of an "image" upon the retina. In terms of mechanics, then, we may describe the eye as a water *camera obscura*, with a self-adjusting lens, and a concave, sensitive membrane as a screen on which the image is

formed. The formation of the image is accomplished by carrying the rays of light reflected from the external object through a series of refracting media and bringing them to a focus on the screen. The rays of light do not, however, immediately excite the fibrils of the optic nerve as these fibrils are spread over the front part of the retina. They pass through the front layers of the retina, and produce upon the back part of this membrane certain obscure photo-chemical changes; it is these photo-chemical changes which are the more immediate excitants of the nervous elements of the organ (the "rods" and "cones," and through them the nerve-cells and nerve-fibers, of the retina).

In all ordinary sense-experience with the eye, sensations of light and color are blended together. Or, to speak popularly, every particular color is more or less bright and pure; and all degrees of brightness and purity have some particular color-tone. Pure grays, or admixtures of white and black that are not colored with any yellow, red, blue, etc., are rarely or never seen in ordinary vision. In order, however, to illustrate the difference between sensations of light and sensations of color, we may prepare a series of sense-experiences occasioned by blending different areas of pure black and pure white on rapidly revolving disks, when looked at in perfectly white light; or we may try to abstract attention from the brightness of the colors as we focus attention upon the different shades of the same color, or run through in their natural succession the color-tones of the spectrum. To account for these two different but blended kinds of sensations through the eye we cannot, as in the case of the ear, refer to different separable portions of the one organ. Both kinds of sensation originate through excitation of every portion of the retinal area. The attempt has therefore been made to account for this difference in our visual sensations by conjectured differences in the processes in which the two kinds of excitement consist. And since sensations of light vary, in *intensity*, all the way from black to white through many shades of gray, and from the highest to the lowest degree of brightness which any color can have; while sensations of color vary in those peculiarities of *quality* which an inspection of the lines of the spectrum distinguishes, a difference in the nature of the two processes would seem to be clearly marked.[1] But as to the exact nature of this

[1] On these and other grounds Wundt has concluded that in every excitation of the retina two different processes are set up—a "chromatic" (which gives us color-tones) and an "achromatic" (which gives us different degrees of brightness and darkness). The former he would describe as a "multiform photo-chemical process," which changes continuously with the wave-lengths of light; the latter as a "uniform photo-chemical process," which reaches its maximum at green and falls off toward both ends of the spectrum.—Physiolog. Psychologie (4th ed.), I., p. 529 f.

difference we cannot, as yet, be said to have attained scientific knowledge.

More detailed attempts to classify sensations of color introduce certain very curious relations which exist among them. Every color-sensation, among the many thousand distinguishable but similar modifications which the stimulation of the retina occasions, appears in consciousness as an indivisible unity. We cannot analyze the color-tones as we can the tones of sound; even with the assistance of experimental means we cannot always bring out the various simpler elements which combine to produce them. Yet these peculiar modifications of consciousness, in which the essence of the color-sensations consists, can themselves be produced by combining different forms of stimulation. All artificial production of colors is dependent on such facts as the following: When the wave-lengths of the two colors mixed vary but slightly (a few billions of oscillations in a second) from each other, the color resulting from the mixture lies between the colors mixed, and may be regarded as a "shade" of one or the other of the two; and thus by selecting colors that lie apart at different distances along the spectrum, an indefinite number of impressions of color may be obtained. But these mixed impressions of color do not all differ from each other; indeed, the astonishing and important fact is that they may all be obtained by mixture of a very small number of so-called "fundamental" colors. The theory, propounded by Young and elaborated by Helmholtz, reduced these fundamental colors to *three* (green, red or carmine, and blue or indigo-blue); it assumed that in every portion of the retina there exist three kinds of nervous elements, by simultaneous excitation of which in varying proportions all the phenomena of color-sensations may be explained. More recent investigations have thrown great doubt over this theory; they have led to the assumption of at least *four* fundamental colors (green and red, blue and yellow), in addition to white and black, which are also to be considered as genuine color-sensations. But even the assumption of *six* fundamental colors does not serve to account for all our experience with color-sensations.

In our efforts to classify our indefinitely numerous color-sensations, two other important facts are brought out. First, as has already been indicated, we can pass in either one of two opposite directions by shading the color-tone from one color to another widely different color. For example, if we pass from green through blue to indigo and violet, a tendency to come around to red again is visible when we reach the violet; but red can also be reached by proceeding from green through yellow and orange.

For this reason the proper symbolism of color-sensations is not a continuous line like that of musical tones, but a curve which shows a tendency to return upon itself, or a triangle with its base partly, perhaps, invisible. Second, white can be produced by mixing an indefinite number of pairs of colors which lie at some distance from each other in the spectrum. Colors which, by their admixture, produce white, are called "complementary" to each other. Neither the physiological nor the psychological explanation of this form of our sense-experience is clear, but it may be symbolized by the accompanying scheme[1] in which each color in either of the two concentric circles corresponds to the complementary circle of the other, and the possibility of movement to the same end in the two opposite directions is illustrated.

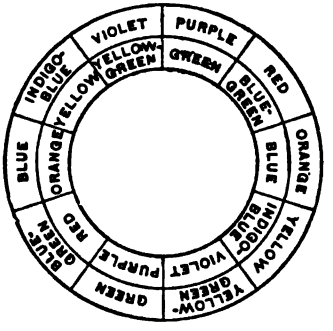


FIG. 1.

§ 14. The parts of the eye which are of most interest to the psychological theory of vision are these three—the retina, the muscles which move the eyeballs, and the self-adjusting lens. The sensations occasioned by the activity of the last two are, of course, muscular and tactual. They are qualitatively of an entirely different order from the sensations of light and color; and yet in all vision with the adult eye they are co-active with the retinal sensations; for *perception is accomplished only as the different classes of sensation-series are fused into one continuous sense-experience.* In order to understand this fusion it is important to know that the centers of the brain in which the cerebral control of the muscles of the eye is located, are closely connected with those tracts and areas where elaboration of the visual impressions takes place. This local connection and simultaneous activity are the physical basis of the psychical fusion which takes place between the light- and color-sensations and the tactual and muscular sensations of the eye.

The retina is a wonderful nervous mosaic, having its various elements arranged in some nine or ten layers. In one of these layers a great multitude of elongated bodies are arranged side by side, like rows of palisades, with their largest extension in the radial direction. These are called "rods" and "cones," and in the place of clearest vision (the "yellow-spot"), where only cones appear, not less than one million are supposed to be set in a square $\frac{1}{170}$ inch. The retina of the eye thus appears adapted to an astonishingly minute work of analysis, but of a different character from that performed by the organ of Corti in the ear.

While we are confident that in the excitation of the optic nerve, through the rods and cones, chemical changes in the pigments of the eye, under the action of the light upon them, bear an important part, the exact number of

[1] Taken from Wundt, and see my Elements of Physiological Psychology, p. 388 f.

these visual substances, and the precise nature of the change wrought in them and of the influence they exert upon the nervous elements of the retina, are still matters of doubt.

Other forms of stimulation besides light (objective) excite sensations of this class. Among them are various mechanical and electrical stimuli, such as any shock to the eye by a blow, moderate pressure on a limited area of the eyeball by the finger-nail or by a blunted stick (the disks of light with darkly colored edges, called *phosphenes*), or a weak electrical current sent through the eye. Moreover, the changing blood-supply excites the nervous elements of the retina so that they are rarely or never inactive; and thus the most varied and gorgeous coloring is often seen with the eyes closed in a darkened room (the so-called "own light," or *Eigenlicht*, of the retina).

§ 15. Sensations of color-tone are said to be "pure" or "saturated," when they are free from all admixture of other color-tones. Such *pure* colors can be obtained only by use of the spectrum; and, speaking with the utmost strictness, probably not even spectral colors are perfectly pure, since they can be made to appear somewhat brighter by looking at them with an eye already fatigued by a complementary color. Some of the colors may be said to be "naturally" more bright than others. On account, probably, of some peculiarity of the retina, or of inherited faculty of discrimination, the green-yellow of the spectrum makes most impression at any given degree of objective intensity. According to one authority,[1] crimson light has to have one hundred thousand times more energy than green, in order to give light enough to read by it.

It is not quite true to say, as is ordinarily said, that the composite colors of our ordinary experience cannot be analyzed at all by introspective consciousness. To be sure, they cannot be analyzed precisely as musical clangs can. But then the analysis performed by the eye is, in general, different from that performed by the ear. One can, however, distinguish whether a particular shade of green is *blue*-green or *yellow*-green, and perhaps also regard either one of these three colors as giving the fundamental color-tone to the complex color-clang, as it were. It would seem also as though an observer who had never before seen orange, would detect both the yellow and the red in the mixture, as well as the blue and the red which enter into violet. I have never, however, found any one who, prior to experiment, could tell what color will emerge on a rapidly revolving white disk when small sections of black and of orange are intermingled with it (namely, "seal-brown"). And that a mixture of purple and green, or orange and blue, or violet and yellow-green, should result in white, would seem to be quite beyond any power of analytic consciousness to predict.

§ 16. The "Young-Helmholtz theory" of color-sensations is customarily spoken of in England and this country as though it were established science. This is, however, by no means true. Among the facts which militate against it are many like the following: the more nearly we can stimulate singly the particular elements of the retina, the less "pure" is the sensation we obtain. But this is precisely the opposite of what we should expect from the theory. Moreover, red and green, which are together—according to the theory—necessary for yellow, appear singly, when seen on

[1] Professor Langley, see Am. Journal of Science, 3d series, xxxvi., p. 359.

the periphery of the retina, to be yellow. Nor does it seem as though all the cases of color-blindness could be accounted for by dropping out one kind of nerve-elements, as the theory would have us suppose.

Other similar objections may be urged against the theories of investigators, like Hering and Hess, who advocate at least three pairs of fundamental colors and six corresponding processes. The more investigation into this very interesting subject progresses, however, the more apparent do these three things become: (1) The phenomena of color-sensations, psychologically considered, are extremely complex, and a larger number of physiological components or processes seems constantly to be demanded for their explanation; (2) a great variety of individual experiences, and even many idiosyncrasies, have to be admitted; and (3) any particular sensation is the resultant as respects its quality, of a number of concurrent causes, among which the brain-center (and not the retina alone) and the psychological habits and training (and not the quality of the external stimulus alone) bear an important part.[1]

The Sensations evoked by stimulating the Skin are various; and some of them are, as respects quality, exceedingly obscure in origin and character. There can be no doubt, however, as to the very important part which these sensations bear in the growth of our sense-experience. In this general organ (the *skin* or membrane which covers the peripheral parts of the body and lines certain internal organs) a variety of specially differentiated end-organs is found. But although the different areas of the skin have different degrees of sensitiveness to particular forms of stimulation, and although different minute spots seem to respond to any form of stimulation with only one of the several kinds of skin-sensations, we are as yet unable to assign the different sensations to the different forms of the end-organs.

Many of the more vague and obscure sense-impressions derived through the skin are exceedingly complex. Not only do they result from the fusion of qualitatively different sensations, but they also depend for their character upon appreciable changes which take place in time. This is true of "sensations of motion," and of sensations like those of "tickling," "thrilling," and of other forms of dermal sense-experience which are difficult to describe. Two kinds of sensations are, however, awakened by stimulation of this organ which are of perfectly unique and incomparable quality. These are (1) sensations of pressure and (2) sensations of temperature. For al-

[1] For the more recent elaborate researches into the constitution and explanation of color-sensations see von Kries: Archiv f. Anat. u. Physiol, 1882, Appendix and 1887. Hering: Sitzgsbr. d. Wien. Acad., 1872-74, and Pflüger's Archiv, xlii. and xliii. Wundt: Physiolog. Psychologie (4th ed.), I., 492 f.; and Philosoph. Studien, 1887, iv., Heft 2. Hess: Archiv f. Ophthalmologie, 1890, pp. 1-62. Kirschmann: Philosoph. Studien, 1892, viii., Heft 2; and various articles in these and other similar periodicals.

though—as we are accustomed to say—we can "feel," in the same state of consciousness, the same thing to be both smooth or rough and warm or cold, the sensations, on the basis of which we know the former qualities, *as sensations*, in no respect resemble the sensations on the basis of which we know the latter qualities. Moreover, one of the most interesting and important of modern psycho-physical discoveries shows that all the areas of the skin have a larger or smaller number of both "pressure-spots" and "temperature-spots." It also seems probable that the entire nervous mechanism concerned in touch is more or less distinct from that concerned in temperature. But whether the histological and physiological distinction can be clearly established or not, the psychical distinction between pressure and temperature is perfectly clear.

While, however, the analysis which discriminating consciousness can make divides clearly between sensations of pressure and sensations of temperature, within each of these classes differences of intensity rather than differences of kind are most easily distinguished. Further analysis does reveal, however, two wholly different kinds of temperature-sensations—namely, sensations of heat, and sensations of cold. If physics considers "cold" and "heat" as mere matter of "degrees," physiology and psychology regard them as wholly distinct in kind. Whether the different degrees of each of these two temperature-sensations are not also qualitatively unlike may, perhaps, admit, of doubt. In our judgment consciousness gives an affirmative answer to this inquiry. But that different light-pressure sensations differ in quality as well as in degree, is a fact of indispensable importance for the entire theory of perception by the senses.

§ 17. Histology shows that the sensory nerves which are distributed to the skin terminate in one of two ways, either in free end-fibrils or in special structures called "tactile corpuscles" or "end-bulbs." The different varieties of these structures ("corpuscles of Pacini," "end-bulbs of Krause," "corpuscles of Wagner") are essentially alike; they are capsules of connective tissue surrounding exceedingly minute threads of nervous matter, and are designed to modify and multiply the effect of the stimulus upon the nerves of sense. But since the surface of the skin is sensitive, both to light pressure and to temperature, in areas where these corpuscles are not found, they cannot be the *sole* end-organs of these sensations. The fact that the special end-organs are most constant and numerous in those parts of the body most employed in active discriminating touch seems to indicate that they have a special connection with that form of mental function.

The evidence that the apparatus in the skin which is concerned in the production of these three kinds of sensation (heat, cold, pressure) differs for each of the three, will be adduced later on. It belongs to physiology, of

course, to show how far the three travel by different paths along the spinal cord and lower regions of the brain. The general area of the cerebral hemispheres concerned in tactile sensibility seems, as we might expect, to "lie about and coincide to some extent" with the areas concerned in motor control of the members of the body. So-called "temperature-centers" in the lower and higher regions of the brain are being discovered. From the psychologist's point of view such investigations are especially interesting on account of the phenomena of tactile anæsthesia (or loss of sensitiveness to light pressure) and of disturbances of the self-consciousness, through missing or abnormal sensations of the skin. Psychology has to recognize that what I am, as feeling "natural," or "strange," or "quite unlike myself," is to no small extent a question of changes in the sensation-complexes of the skin. So that the fundamental importance, for the entire mental life, of this organ, whose structure, when compared with that of the eye or the ear, seems so simple, and whose intellectual and spiritual uses and abuses are often so little considered, becomes more and more obvious.

Sensations of Pressure or light touch are ordinarily excited by contact of the skin with some external object; although, like all our sensations, they may also be occasioned by intra-organic changes. In passive, but more especially in what is known as "active," touch these sensations are combined with those arising through irritation of the muscles and joints. Sensations of pressure are apt, like all sensations of this order, to be characterized by a strong tone of feeling. Although, in our adult experience familiarity and the superior interest we take in obtaining a knowledge, by touch, of external objects, make us overlook the minuter distinctions in quality, yet a revival of discriminating attention confirms the demands of the theory of perception; thus we are able to say that sensations of pressure differ indefinitely in quality; and this happens chiefly on account of the difference in the areas of the skin by whose stimulation they are occasioned. Indeed, experiment shows that clear-cut and definite sensations of pressure are occasioned only by exciting certain minute areas of the skin—the so-called "pressure-spots." These pressure-spots, although they are found all over the body, are differently distributed in different places; they also differ in sensitiveness, for some are much more easily excited than others.

§ 18. Most psychologists have distinguished *active touch* from sensations of pressure as differing in kind. But so far as we do not introduce other sensations connected with the *movement* of the organ, the difference is one of degree only. If a fine point of metal, wood, or cork, be moved lightly over the skin, it will awaken definite, and "content-full" sensations of pressure only at certain minute spots in any given area of the skin. When sensations of this order are awakened by stimulating the intervening spots, they may be described as comparatively dull, indefinable, "content-less." [1]

[1] See the article of Goldscheider, Archiv f. Anat. u. Physiol., 1885.

The arrangement of the pressure-spots is in chains, as it were, which ordinarily radiate from a kind of central point, and run in such directions as to form either circular, longitudinal, or pyramidal figures. It need scarcely be said that spots of the higher degrees of sensitiveness are more numerous in those areas of the skin which are most discriminating in touch. The accompanying figure shows the arrangement of pressure-spots on the back and side of the first phalanx of an index finger.

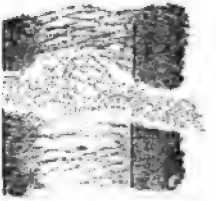


FIG. 2.—Arrangement of pressure-spots (Goldscheider).

Sensations of Temperature—and this is one of the most astonishing discoveries of modern experimental psychology—have their origin in the irritation of definite spots on the skin. Moreover, the existence of "heat-spots" and "cold-spots" (or minute localities of the organ that are sensitive to heat and not to cold, and conversely) seems demonstrable. These "temperature-spots" and those of pressure appear never to be superimposed. They are not located alike on the symmetrical members of the same body, or on the corresponding parts of different individuals. Heat-spots are, on the whole, less abundant than cold-spots; but in parts of the body where the skin is most sensitive to either heat or cold, the corresponding class of "spots" is relatively frequent. Different spots of both kinds have different degrees of sensitiveness, according to the amount of reaction which they show to a given amount of stimulus. In certain minute areas sensations of temperature are roused only by excessive temperatures. The same object feels only cool to one spot, and ice-cold to another.

Apparently, any form of stimulation which excites the nerve-endings in the temperature-spots calls out the appropriate form of sensation—whether it be the electrical current or the temperature of a body in contact, or changes going on in the tissue of the skin itself. The exact manner in which changes of temperature act upon the thermic apparatus in the organ is not known. The theory of physics, that heat and cold are only relative terms indicative of different degrees of one mode of motion, not only does not explain the physiology and psychology of temperature-sensations, but squarely contradicts the facts to be explained. Physiologically and psychologically, heat and cold are qualitatively *unlike* sensations. With the accompaniment of feeling which they have, however, they may be traced, through different degrees, down to a so-called "zero-point," or "point of indifference;" this means that no temperature-sensation is called out by certain low degrees of stimulus.

§ 19. Recent investigations[1] have found the temperature-spots relatively insensible to pain (a needle can be run into them without being felt), even to the pain of temperature. Mapping out the different areas of the skin shows that the spots generally radiate from centers coincident with the roots of the hairs, where such appendages are found. The lines they form run so as to cross each other and make figures of various shapes—triangles with rounded corners, etc. The accompanying figure shows the arrangement of (*A*) the heat-spots and of (*B*) the cold-spots on a portion of the palm of a left hand.

FIG. 8.—Arrangement of Temperature-spots. *A*, Heat-spots, and *B*, Cold-spots—from the palm of the left hand (Goldscheider).

§ 20. By the "zero-point" of any part of the skin we understand that degree of objective temperature which may be applied to the part without producing any sensation of temperature whatever. This is difficult to find, is different for different areas, and constantly changing. Some observers, following E. H. Weber, have held that all rising of the temperature of the skin is felt as heat, and all sinking of its temperature as cold. In evidence such experiments as the following classical one are adduced: If we immerse the hand for some time in water at the temperature of 55° Fahr., and then put it into water of 65° Fahr., the latter will feel warm at first, although it will feel cold to the hand which retains its normal temperature of skin. Other investigators hold, with Hering, that it is not the rising or sinking of the temperature of the skin, but the *being* stimulated by something whose temperature is above or below the present zero-point of the skin, which causes the thermic apparatus to react in either direction. Thus they would explain the phenomena of temperature-sensations not only by contact with extra-organic objects, but also by intra-organic changes, such as increase and lessening of the interior warmth of the body, etc.[2]

Here, however, we are met by the apparent fact that, in certain cases (of disease, or when a limb is "asleep") sensitiveness to heat can be retained after sensitiveness to cold has been lost. The infinite variety of psychical life, and its physiological conditions, is thus again seen to be much beyond the power of physics to deal with it. Especially does it appear that tem-

[1] Blix, Goldscheider, Donaldson, et alt.; and see the author's Elements of Physiological Psychology and the citations there, p. 848 f.

[2] A later conjecture is that the nerves of temperature end in different kinds of tissue which have different characteristics of "temperature contraction." Thus, the heat tissues may be actively contracting when the cold tissues are either passive or actively expanding, and *vice versa*. Each of these tissues, moreover, may be conjectured to have its range of temperature activity; and each range to be complementary to, and exclusive of, the other. (See art. by Dr. H. Nichols, Philosoph. Rev., July, 1892, p. 427 f.)

perature-sensations, like all classes of psychic facts, are incapable of explanation in isolation from the stream of consciousness. They are what they are, only as discriminating attention is applied, and intellectual processes of memory, ideation, contrast, etc., are admitted into our explanation of them.

The fate of those Sensations which it is customary to call "Muscular," has been somewhat peculiar. For, on the one hand, some psychologists have considered those modifications of sense-experience which are directly due to changes in the muscular tissue as among the most fundamental and influential of our entire mental life; but, on the other hand, there are other modern psychologists who still persist in denying the very existence of muscular sensations. The truth is with neither of these extreme views. Nor does the truth lie between the two extremes. *The muscular sensations take their place in our mental life as factors blended with others in the complex resultant of the activity of all our sense-organs.*

That there are sensory nerves which stand in the proper histological relations with the muscular tissue, to be excited by the change which takes place in this tissue, seems to admit of little doubt. Consciousness gives quite clear testimony to the existence of distinct and peculiar modifications of our sense-experience which can arise only in the activity of the muscles. The evidence from pathology points in the same direction; for it shows that the loss of tactual or joint sensations does not necessarily involve the loss of the sensations ordinarily attributed to the muscles. Experiment, on the whole, confirms the testimony of discriminating introspection, and of pathology. While the theory of perception, especially in the case of the so-called "geometrical" senses of sight and touch, almost imperatively demands the admission of this class of sensations. Finally, the most general biological view of the conditions of the development of all mental life seems to require such a fundamental connection, as it were, of the factors of sensation and motion. Unless we "sense," or—to use the term of Bain—"feel," our own muscles, it is difficult to explain how we can know ourselves as "bodies," in any intelligible meaning of this word.

As to the question, whether there exist sub-classes of muscular sensations, as respects their quality, we find it more difficult to reply. The massiveness, or depth, of our sense-experience undoubtedly varies according to the amount of muscular tissue either actively or passively involved. Here, as elsewhere, increase in intensity is interpreted as a spreading, in all directions, of extension. But how far this is due to changes in quality of the muscular sensations themselves rather than to changes in

the quality of the accompanying sensations of the skin, is not easy to determine. The influence of centrally (or in the brain) originated modifications of consciousness, which blend with those originating in strained muscles and tightened skin, and joints pressed together, and form the exceedingly complex and important "feeling of effort," must also be admitted. It is a general principle, however, that changes in the quantity of any sensation occasion changes in its quality, and that both kinds of change are inseparably connected with our entire process of *localizing* sensations, whether within the body or on its surface. *We seem justified, then, in holding to certain rather gross differences in the quality of the muscular sensations of the larger masses of the body.* A much greater power of discrimination, both as respects quality and quantity, undoubtedly belongs to the muscles of the eye. The reason why we do not ordinarily notice qualitative differences in our muscular sensations are these three: (1) The differences themselves are gross and less important for nice discrimination; (2) these sensations are ordinarily buried in the purposeful perception of the object, or the doing of the work, on which the muscles are employed; (3) they are thoroughly fused with general tactual and other specific sensations which are more clearly distinct or obtrusive as respects differences in quality.

§ 21. For a long time it was disputed whether sensory nerve-fibrils are so connected with the muscular tissue as that its contraction or compression can irritate them. But Sachs, in 1874, announced the discovery of the apparatus which seemed necessary for specific muscular sensations. More recent investigations have changed his view as respects the precise manner in which the last subdivisions of the nerves are related to the tissue of the muscle. Moreover, the complex resultant, in consciousness, of the movement of the muscles is ordinarily also dependent upon accompanying excitation of nerve-endings in the tendons and adjoining membranes covering the bones. But all this does not diminish the evidence in favor of the conclusion, that the muscles also contribute to our sense-experience.[1]

§ 22. We may bring out the testimony of analytic introspection to the existence of muscular sensations by various simple experiments. For example, let one rest as lightly as possible the tip of the index finger against some firm object, and consider only the sensations of light pressure which he localizes there. Then let one slowly increase the pressure until one is pressing "with all one's might" against the object, meanwhile carefully watching the changes which take place in the stream of consciousness. (1) The skin-sensations will expand over wider and wider areas, change the qualities of their mixture and their locality, as they creep up the arm and spread down the sides and back. (2) The sensations of squeezing at the joints will be

[1] On the entire subject of the muscular sensations, see Beaunis: Les Sensations Internes, chap. viii.–xiv

evoked in the finger, wrist, elbow, and shoulder joints. (3) The complex feeling of exerting one's self will grow until one's whole interior strength and very self seems entering into the exertion against the resisting object. But (4) certain sensations, differing from those attributed to skin or joints, will be discerned, which also spread up the arm and down the sides and back, but which seem to lie much deeper than the skin under which they are localized. Again, every one who has begun gymnastic exercise too suddenly, or tried to lift unaccustomed weights, knows how peculiar are the sensations evoked which make him *aware of* the existence and activity of the deeper lying and hitherto unused muscular tissues.

In spite of the fact, moreover, that cutaneous anæsthesia and paralysis of muscular sensibility often go together, cases arise where one occurs and the other not. Muscular sensibility is sometimes preserved, as shown in the ability to discriminate weights when the muscles are called into play, after cutaneous sensibility is lost; and muscular sensibility is sometimes lost when cutaneous sensibility is retained or even increased. M. Beaunis found that a singer could sing almost as accurately as before, when the sensibility of the mucous membrane of the larynx and vocal cords had been destroyed by cocaine. This performer must, then, have guided himself by muscular sensibility. Lussana found a patient, who had lost the skin entirely over an area of 10 x 12 ctm., without any impairment of the muscular sensibility of the subjacent contractile parts.

The use which a satisfactory theory of perception makes of the muscular sensations in acquiring knowledge of the character, position, and movements of our own bodies and of all other bodies which call the muscles into play, will appear later on. Some writers go so far as to maintain that the intimate connection of sensation and motion in the use of the muscles (*Muskel-Gefühl*) is the one simple element out of which all psychic processes are constituted by repetition and combination.[1] Another writer[2] maintains that, with the entrance into consciousness of every sensation of a special sense, there occurs a no less great throng of motor sensations. Thus the nerves of motion lose their one-sided character and indirectly take part in all our sense-consciousness as "nerves of an active sense" (*Muskelsinnes*). Yet another authority[3] would have us believe that, whenever any sensory impulse stirs the mind to perception, a reaction, consisting of certain involuntary changes, states of tension, and tendencies, takes place. In this way, not only is the organ disposed in a way appropriate to the intuition of the object, but the character of the sense-experience is determined.

The part which Sensations of the Joints play in our sense-experience has recently been (sufficiently or even over-much) insisted upon. These portions of the body also are found to have their necessary equipment of nervous apparatus. With what other forms of sensations (tactual and muscular chiefly) the articular sensations are chiefly connected has already been explained. Their usefulness as sense-elements in the perception

[1] Horwicz: Psycholog. Analysen, 1, p. 202. [2] Fortlage: Beiträge zur Psychologie, p. 235.
[3] Esser: Psychologie, § 11.

of the position and movements of our own bodies is undoubted; but this is not so to be understood or explained as to sacrifice to them either the muscular or the cutaneous sensations. Skin, muscles, and joints, all three—it is by sensation-complexes arising in them that, without sight, we know how to orient ourselves, whether passively or actively, with reference to the different members of our body, as related to each other and to surrounding objects.

§ 23. The osseous extremities, periosteum, ligaments, and synovial membranes are rich in nerves; and special end-organs resembling those of touch ("corpuscles of Pacini") have been found in the neighborhood of all the joints. Goldscheider[1] found that, with the hand held fast in a plaster cast, the least angular bending of the finger's first joint could be perceived. But if the joint was rendered anæsthetic, then the finger must be bent far more to be perceived than before. Cases have been reported where those suffering with loss of cutaneous sensibility were very sensitive to pressure on the joints; and ataxic persons have been found who were able to recognize slow movements of the limbs, with short excursions, if the movements were accompanied by pressure on the joints, but otherwise not. Consciousness confirms pathology and experimentation by calling attention to the different "feelings" which we localize in the joints, according as they are set tightly together or not, and are bent more or less strongly and rapidly.

It has been the custom of psychologists to recognize so-called "Organic Sensations" as constituting a class by themselves. There can be no doubt that peculiar forms of sense-experience originate in the condition and changes of the internal organs (heart, viscera, lungs, etc.). These are not, however, to be explained as involving any new kinds of simple sensations. They are rather specific combinations of the simple sense-factors already examined, and, especially as characterized by tones of feeling—mostly, if not wholly, disagreeable—due to the character of the stimulation which excites the sensations. Temperature-sensations and sensations of pressure or of the muscular sense, as well as sensations of motion, are not essentially different when they originate and "fuse" in consciousness on account of organic changes lying deep within the body. The so-called "organic sensations" are therefore more appropriately referred to (so far as is desirable in any brief account of the mental life) in other connections.

Substantially the same thing is true of such so-called sensations as Hunger, Thirst, sexual and other Appetite, Nausea, Repletion, and scores of other less well-known but highly com-

[1] See art. Ueber Ataxie u. Muskelsinn: Verhandlungen d. physiolog. Gesellsch. Berlin, Aug., 1897.

plex and yet comparatively "contentless" and obscurely localized sensations.[1]

By introducing different principles of classification, it is, of course, possible to arrange the foregoing kinds of simple sensations according to a variety of schemes; but such schematic arrangement neither increases nor diminishes the number of fundamentally different classes. Thus, if we regard the amount of assistance which, by movement intelligently directed, the organ can give to discriminating consciousness, we may divide into the following three classes:

(I.)	(II.)	(III.)
Sight,	Taste,	Hearing,
(Active) Touch,	Smell,	Temperature,
Muscular Sense.	Joint-Sensations.	(Mere) Pressure.

In the first of these classes the moving and *active* organ largely controls the amount and kind of sensation which can be discriminated; in the second it does this to a less degree, and the *passive* character of the sensations produced becomes more prominent; in the third class the contribution made by controllable activity of the external organ sinks to a minimum or is wholly lost.

Our subsequent study of the development of perception by the senses will lead us to emphasize the important difference between those senses which may be called "geometrical" (preeminently the eye, skin, and muscles) and those which are, at least relatively, if not absolutely, non-geometrical; while a persistent opposition between Sight and Hearing has its basis in the fact that one is preëminently the *space*-sense and the other the *time*-sense.

[For the physiology of sensation and the sense-organs see, besides the ordinary treatises on physiology, Wundt: Physiolog. Psychologie (4th ed.), I., chap. vii. Ladd: Elements of Physiological Psychology, i., chap. v., and ii., chaps. iii., iv. And Hermann: Handbuch d. Physiologie, II., 1, 2, and III., 1, 2. Bernstein's Five Senses of Man gives a brief popular treatment. For more advanced and detailed study the great monographs of Helmholtz: Physiologische Optik, and Tonempfindungen. Stumpf: Tonpsychologie. E. Gurney: The Power of Sound. And scores of minor monographs and articles may be consulted.]

[1] The reader who desires a detailed description of these sensation-complexes fused with feeling, may consult works like Bain: Senses and Intellect, pp. 104-136, and 240-320.

CHAPTER VII.

SENSATION: ITS QUALITY AND QUANTITY

By an act of mental analysis, which all readily learn to perform, different sense-experiences are known to differ as respects both quality and quantity. Every simpler sensation discernible in the general field of sensuous consciousness appears capable of being related to others as like or unlike it in kind, and as equal to, or less than, or greater than, others in amount or intensity. Indeed, *how* I feel, and *how much* I feel, are popularly supposed to be questions, the answers to which are not even necessarily connected. For, as most untrained observers would say: Is not a very sour taste more unlike a bitter taste than is a moderate degree of sourness? Or: Is not bright red more clearly distinguishable from bright yellow, or a loudly sounded $a\sharp$ from c, than an exactly like sensation of color or musical tone which has only a weak intensity?

The distinction between *quality* and *quantity* does, indeed, really belong to all our sensations, and is not merely put into them, as it were, by our choosing to regard them in one "aspect" rather than another. But careful psychological investigation shows, what the popular judgment only very imperfectly, or not at all recognizes, namely, the intimate and inseparable dependence of quantity and quality upon each other. Although quality and quantity of sensation are not the same, and the experience which enables us to answer the question, What kind? differs from that which enables us to answer the question, How much? yet changes in one probably always involve changes in the other.

The description of the minuter differences in the quality of sensations has comparatively little interest for psychological science. What is desirable to ascertain precisely is rather this: On what conditions, and according to what laws, do the many varieties of sensation arise, endure, and fade away in the stream of conscious mental life? In other words, we seek to discover the more general principles which explain the various kinds of our sense-experience. So, too, in discussing the quantity of sensation: it

would be tedious and profitless to describe the indefinite gradations in intensity through which every kind of sensation may pass, all the way from a maximum down to zero. Here again we wish rather to know, if possible, the general conditions on which, and laws according to which, sensations gain their differing degrees of intensity. And, finally—since, as has just been said, changes in quality and changes in quantity are interdependent—we wish to ascertain the uniform relations between these two classes of variation.

§ 1. According to Sully:[1] "Quality is clearly distinct from quantity, and may in general be regarded as independent of it. That is to say, we can vary intensity without affecting quality. This would appear to follow from the assumed dissimilarity of the underlying nervous conditions." On the contrary, that would appear to follow from the known connection of both the peripheral and the central nervous conditions which we find to be true by experiment: namely, we *cannot* vary intensity without affecting quality. But other writers go quite too far in the effort to minimize the distinction between intensity and quality. For example, Münsterberg declares[2] that "quality and intensity are not two particular properties of the one sensation, but only the directions in which the one sensation can be compared with other sensations." Although, however, the two "properties"—quality and intensity—*are* particular, and although the "one sensation" to which they belong is *one* sensation, and not two sensations, yet discriminating consciousness, by changing the focus of attention, as it were, can regard one of these two properties to the partial or total exclusion of the other. Thus, for example, if I am going toward, or away from, a bell which is being struck periodically, or if I strike with varying degrees of strength the same note on the piano-forte, I am likely to attend only to the changes of intensity. So, too, the familiar objects in my room do not seem to change their color-tone as the intensity of the sun-light which falls upon them changes. On the other hand, if I wish to discriminate nicely the quality of a sensation of musical sound or of color, I have to make provision for a uniform intensity of stimulus to secure an exact comparison. One does not venture to select one's wall-paper without considering the amount of light which is to be reflected from its different areas; and, when it is laid, one begins to notice how agreeably or disagreeably different are the upper from the lower portions of the walls, the corners from the middle surfaces, etc. The violinist who wishes to give the right qualitative effect to his part in the quartette knows that he must play neither too loudly nor too softly.

§ 2. Strictly speaking, the number of qualities which the sensations of some of the senses may assume is incalculable; not because, of course, the number is infinite, but because it is indefinite and dependent upon a variety of concurrent conditions. For example, the number of color-sensations distinguishable in quality, with all kinds of admixture and all degrees of brightness, has been given at different figures from five thousand to many millions. Herschel thought that the workers on the mosaics of the Vatican

[1] The Human Mind, I., p. 88. [2] Beiträge, iii., p. 10.

must have distinguished thirty thousand different colors. Von Kries found himself able to recognize two hundred and thirty spectral tints. The number of recognizable different musical sounds ranges through some eleven octaves, in some portions of which trained ears can distinguish over three thousand notes, where the piano-forte gives only 24.[1] When we multiply these numbers by the possible differences in timbre, we find the variety in qualities of sound rising into the thousands. Of smells, as we have already seen, no one knows how many varieties there are; nor is the number of different possible tastes easy to state. Sensations of touch, we may find ourselves compelled to admit, are as many as are the distinguishable areas of the body when subjected to being touched. That all muscular, temperature, and joint sensations are qualitatively alike, it is perhaps easier to persuade one's self. But even here we have seen that a somewhat indefinite variety of quality seems to demand recognition.

The Conditions which determine the Quality of Sensations vary, in many particulars, for the different classes of sensations. There are, however, certain general conditions upon which by far the greater number of all our sensations of every sense depend for the determination of their quality. The more important of these are the following:

In the first place, the Quality of Sensations varies in dependence upon the original or acquired Characteristics of the Organism through whose excitement the sensations originate. To know that blind men cannot see, and deaf men cannot hear, needs no appeal to psychological science. It is matter of popular information also that certain persons are more or less color-blind, others more or less tone-deaf, others more or less defective in power to taste and smell, and still others relatively lacking in nicely graded cutaneous and muscular sensations. More detailed scientific observation and experiment enable us to go beyond all this. *The sense-experience of every individual is, so far as range of quality in each of the senses is considered, peculiar to that individual*; taken as a whole, it may be said to be unique.

This "individuality" of all sense-experience is, in part at least, determined by the individual characteristics of the different parts of the sensorium, especially of the end-organs of sense; and such organic characteristics may result either from inheritance or from the modifying influences of the different forms of environment. Less obvious, but not less real, is the dependence of the quality of sensations upon the peculiarities of the central and cerebral mechanism.

§ 3. The temporary effect of functional disturbance of the end-organs, by inflammations, congestions, etc., in impairing the number and distinctness

[1] Cattell, in Mind, Jan., 1888, p. 43.

of smells and tastes, needs only to be mentioned. Soaking the end-organs of smell, and drying the end-organs of taste, destroys wholly or partially the qualities peculiar to different substances when tested by these organs. Many persons are habitually quite incapable of having olfactory and gustatory sensations with the qualities of which others are perfectly familiar. If we might press so far the figure of speech, we should say: they are psychically "deaf" or "blind" to the various "tones" and "colors" of things as tasted and smelled. The delicately shaded qualities of dermal sensations with which some persons respond to stimulus of the skin are a perfectly unknown experience to others. Thus Stumpf tells of a student of music in a German conservatory who could not learn to play correctly on the violin —not because he was deficient in "ear" for tone-colors, but apparently because, through some obscure defect in the end-organs, he could not evoke the necessary variety of tactual and muscular experience.

In sensations of sound there is the widest "range" of characteristic defects or excellences as respects variety of quality. While Helmholtz, for example, ceased to hear a musical sound below 34 vibrations per second (about *C* in the contra-octave), Preyer could hear the octave below. While most persons failed, in Turnbull's experiments, to hear tones above d^7 or e^7 (about twenty thousand vibrations per second), others can hear the octave above or even higher. Thus, what is heard by one listener as a weak drone is heard by another as a deep bass note; and what is heard by one as a very high tone is rather felt by another as piercing pain or arouses no sensation at all. So, too, by natural and acquired differences in "sensitiveness" to pitch, while some are "tone-deaf" (do not "know one note from another," cannot distinguish semi-tones or even thirds), others can recognize one hundred or two hundred distinctions of pitch between the successive tones of the ordinary scale.

The interesting phenomena of *color-blindness* have received much attention of late. Through defective structure of the retina, certain persons are deficient in power to see certain of the many spectral colors. In many cases the defect amounts to a partial or total insensitiveness to the red rays; these rays are then liable to be confused with dark green or yellow. The spectrum is thus said to be shortened for these sufferers at its red end. Cases of so-called "violet-blindness" have also been reported. In total color-blindness, shades of gray from black to white constitute the total sensuous outfit, as it were, produced by excitations of the retina. The most recent investigations seem to show that—whatever theory of color-blindness we may be inclined to adopt—the phenomena are much more complicated than has ordinarily been supposed. We can scarcely, then, divide all color-blind persons into two groups only: namely, the "red-blind" and the "violet-blind" or "green-blind."[1] At least one case of monocular partial color-blindness is on record, where violet, green, yellow, and all intermediate colors were wanting, and only red and blue remained.[2] An indefinite variety of partial deficiencies must probably be recognized. Even so-called "normal" eyes respond to the same objective stimulus with different

[1] So König and Dieterici: an opinion which the Am. Journal of Psychology seems rather too prompt to declare proven. See February number, p. 311, 1888.

[2] See the article of Kirschmann: Philosoph. Studien, viii., Heft 2 (1892). And comp. a case reported by Vintschgau: Pflüger's Archiv, 1891, p. 481 f.

qualities of sensation, as any observer knows who has thoroughly tested the matter.

§ 4. The effect of practice in increasing the power of making distinctions in quality is, of course, closely connected with the subject now under discussion. Such differences are mainly developed in the cerebral processes by repeated action of the stimulus. But the training and modification in minute structure and functions of the end-organs is not to be left entirely out of account.

In this connection also should be mentioned the cases of those persons who have a range of qualitatively different sensations quite beyond all ordinary experience. What is called the "Reichenbach" experiment, for example, appears to show that a halo may be seen above magnets, when the electrical current is passing through them, by a favored few. In the hypnotic state, too, all the variety of olfactory sensations which belongs to some of the lower orders of animals seems sometimes to be developed in man; and the subject becomes able to assign to each one of a score of owners, by smell, his peculiar belongings. Cases are also on record of persons who could detect the sex, or even the personal idiosyncrasies of others present, by the sense of smell; by the same sense physicians recognize at a distance small-pox or other diseases. In all these cases perceptive discrimination is of course involved; but the basis for such intellectual activity must be laid in unusual natural wealth of sensations. *Wealth of minutely shaded sensuous impressions and trained tact go together.*

The Quality of Sensations depends, second, upon the particular Part of the external Organ to which the organic stimulus is applied. In the gross, as it were, each entire organ seems to act as a totality in the production of sensation. But more careful analytical investigation shows that this way of stating the case is not satisfactory. No organ can be considered in the gross, and at the same time as affording an explanation of the variety of the sensations which its excitement occasions. In truth, *every organ is a composite of a vast number of nerve-elements; and this fact corresponds* (at least in some general way) *to the variety of the sensuous impressions which its excitement occasions.*

§ 5. In the case of smell, experiment has not succeeded in pointing out any changes in quality of sensation, which plainly depend upon the portion of the olfactory membrane excited by the effluvia. Whether this is due to the apparent impossibility of applying the appropriate stimulus in a strictly limited way, or to the nature of smell as exceptional, we cannot say. As to the fact that variations in the qualities of tastes, tones, touches, temperatures ("heat-spots" and "cold-spots"), and muscular sensations are connected with the part of the organ to which the stimulus is applied, enough has already been said. The case of sensations of color remains; and this illustrates the law by a great number of phenomena. For, if we divide the entire field of the retina into three zones—polar, middle, and peripheral—we find that the same objective stimulus regularly produces different kinds

of color-sensations according as it falls within one or the other of these three zones. In strict fact, no clearly divided "zones" can be discovered; but as the stimulus travels over the retina from center to periphery, it evokes different sensations for the different points, provided they are far enough from each other. Thus, at a certain distance from the center, blue and yellow are the only colors seen; farther away, none at all. Rays which, when falling on the polar zone, make an impression of red, yellow, or green, all make an impression of yellow a few millimeters from the center of the retina; and this yellow is the paler, the greener the impression on the polar zone. One observer[1] found that, on movement from center to periphery, red became orange, violet, then blue. Another observer found that only yellow, green, and blue change in saturation, on movement toward the periphery. The different parts of the retina are also differently sensitive to brightness (or light); and this sensitiveness is different for different eyes. In general, distinctions of quality fade out or fade into each other—qualities of color-tones become fewer and die out—as the stimulus travels from center to periphery of the retina.

The Quality of Sensation depends, third, upon the Condition of the Organism, as due to previous excitement, at the time when it is stimulated for the production of any given sensation. This law appears to be true for both the end-organs and the central organs of sense. It is connected closely with a general psychological principle which we shall find entering profoundly into all the activity and development of mental life. No factor of any complex state and no individual state in the onflowing stream of consciousness can be considered as respects the question, What is it? in isolation from contemporaneous and immediately preceding factors and states. Each factor, each state, is determined to be what it really is, by its relations to the contiguous totality of which it forms a part.

This general "principle of relativity" is provided for by the very structure and functions of the organism. Under no ordinary circumstances, and scarcely under any circumstances which can be artificially secured, can one element alone of the organism be excited. Nearly contiguous elements must be simultaneously excited, although in less degree and in a somewhat different way. Moreover, every particular excitation breaks in upon the stream of nerve-commotion in which the organism is continually found, only on condition that it shall enter into connection and fuse with what it finds already there. This is true even of the most quiescent of the end-organs of sense. The end-organs of every sense are ceaselessly in process of nerve-commotion. But particularly is this true of those central or-

[1] See Kirschmann: Ueber die Helligkeitsempfindung im indirecten Sehen—Philosoph. Stud., v., Heft 3, pp. 447–497. And comp. Hess, in Graefe's Archiv f. Ophthalmologie, xxxv., Heft 4, 1889.

gans of the brain that are, without pause day or night for a single fraction of a second, reverberating, as it were, to countless voices which call to them from every part of the periphery, and which call back and forth between these centers themselves.

Yet this ceaselessly inter-responsive molecular mechanism is only the physical correlate of the interaction which takes place between the different factors of each mental state and between all the successive states. Psychology has been wont to recognize this—although only very imperfectly—in the form of a theory of "the association of ideas," or of "the relativity of knowledge." But the principle is absolutely without exception, and applies to the qualities of the sensational factors themselves. *To explain fully the quality of every sensation, we must understand, both physiologically and psychologically, the quality of the immediately preceding and contemporaneous sensations.*

§ 6. That smells and tastes, when closely successive, influence each other, every one knows. Indeed, many of the most disagreeable experiences we have with these sensations depend upon this principle. "After-images" of smell and taste (to apply to these senses a mode of speech borrowed from our experience in sight) linger and modify the effects of all forms of stimulation in exciting further sensations. Owing to the nature of the organs, different qualities of the sensations of these senses cannot readily be simultaneously evoked. In the case of two simultaneous odors, the stronger overwhelms the weaker; but sometimes by absorption, as it were. Certain tastes compensate each other. Brücke held that the sour of the lemon and the sweet of the sugar neutralize each other in the brain. We have already seen how sensations of temperature are often *relative* to the condition of the organism at the time when the heat-spots or cold-spots are stimulated. How a surface feels as rough or smooth to us depends—at least to some extent—upon the state of the organ when applied, after being engaged in more or less qualitatively different sensations. In the case even of that sense which is most prompt about clearing up past impressions and receiving new ones, in a perfectly unprejudiced way—namely, the ear—the sensations fall, as respects quality, under the same principle. Thus, an imperfect consonance which follows a discord is itself more "harmonious" than one which is brought into immediate proximity to a perfect consonance. Nor does the sensation which responds to any particular note seem to be precisely the same when we take it, first, as the "sharp" of the note below, and then again as the "flat" of the note above (even on the piano-forte, where exact accuracy of pitch cannot be secured).

§ 7. It is in the phenomena of light and color, however, that we obtain the most numerous and striking illustrations of the same principle. The previous condition of the whole retina, and the contemporaneous condition of parts of the retina contiguous to those on which the light falls, influence profoundly the character of the sensation produced by any particular form of

stimulus. The phenomena of "inertia," "exhaustion," and, less purely, of "contrast," fall under this principle. If we close the eyes, after looking intently for a few seconds at a bright object, we find its image remaining for some time, and only slowly fading out of sight. Such an after-image is called "positive," and is said to be due to the *inertia* of the retinal elements. But if a white positive after-image be watched, it will be seen, by a normal eye, to pass quickly through greenish-blue to indigo-blue and then to violet or rose-color. Such an after-image is called "negative," and is said to be due to *exhaustion* of the retina. If we look for a long time steadily at a small black square lying on a white suface, and then turn the eyes off to a white background, a bright square will appear, and then slowly fade away. But if the square looked at be green, then the after-image will be reddish. In general, the color of the image will be the "complementary" of the color of the object. These phenomena also are said to be due to exhaustion of the retina. Whatever explanation of them be given, they illustrate the dependence of the color-sensations on the previous condition of the organ.

§ 8. Although the complete explanation of the phenomena of "contrast" is doubtful, they do undoubtedly fall to a certain extent under this same principle. Such phenomena may be divided into two classes: contrast of brightness, and contrast of color-tone. Every bright object appears brighter with surroundings that are darker than itself, and every dark object appears darker with surroundings brighter than itself. Under this principle of contrast, phenomena similar to those of complementary colors are obtained. For example, a small square of white on a surface of green, when covered with transparent tissue-paper, appears as red on a surface of whitish hue; on a red ground it appears as green, on a blue as yellow, and *vice versa*. That is, each color-sensation tends to modify, in the direction of its own complementary color, the other color-sensation on which it acts. More recent experiments show that even the most saturated color-tones, when seen without any opportunity to compare them with other surrounding colors, lose in a measure their distinctive quality.

To account for these and similar interesting phenomena, two theories have been proposed. The former emphasizes the truth stated as follows by Wundt: "The sensation which arises through the stimulation of any given part of the retina is also a function of the state of other contiguous parts." But by Helmholtz such phenomena are treated as deceptions of judgment, like those to which we are accustomed in our estimates of distances. The former has been called the physiological, the latter the psychological theory. We cannot discuss in detail these theories. Undoubtedly all explanation here must be *both* physiological and psychological; and probably, in the physiological explanation, both retinal processes and cerebral process are involved. All explanations of the phenomena of contrast, however, illustrate our principle: "*The quality of every sensation is dependent upon the condition of the organism and of the correlated stream of sense-experience at the time when the effective excitation of the organism takes place.*"[1]

[1] The phenomena of "contrast" have been much discussed. In addition to references already made, the reader may consult Helmholtz: Physiolog. Optik (2d ed.), p. 560 f. Fick, in Hermann's Handb. d. Physiol., III., 1, p. 231 f. Hering: Sitzgsbr. d. Wien. Acad., June, 1872 and Dec., 1878, and four papers in Pflüger's Archiv, xl., xli., xliii. Ebbinghaus: Sitzgsbr. d. Königlich. Preuss. Acad., Dec., 1887. Delabarre: Am. Journal of Psych., Aug., 1889, p. 636 f.

Fourth: The Quality of Sensations depends upon the varying Qualities of the Stimulus. This follows of necessity from the nature of the process of perception itself. In the case, particularly, of sight and touch, the sensations, "as such," are habitually disregarded, and attention is paid rather to the things known through the changing qualities of sensation. In our experience we attribute our differing sensations to changes in the temperature, feel, color, and brightness of the things which produce them. To a less degree this is true also of tastes, smells, and sounds.

For purposes of psychological science the external stimuli may be divided into two classes — mechanical and chemical. The stimuli of hearing and touch are mechanical; those of sight, smell, taste, and temperature are ordinarily declared to be chemical. But temperature is doubtful; and, in all cases, even in touch and hearing, the mechanical application of the stimulus probably produces accompanying chemical changes which affect the character of the excitement produced in the end-organ. It follows from this view that *the peculiar characteristics of our sense-experience depend upon the differing kinds and amounts of the molecular changes which irritate the end-organs of sense.*

§ 9. Little need be added to what was said in the last chapter, for the further illustration of this point. In the case of sound and sight, however, somewhat more of detail seems desirable. When the periodic vibrations, which act through the outer and middle ears upon the organ of Corti, reach the number of from about 16 to about 34, they produce in most persons that peculiar modification of our acoustic consciousness which we call the lowest possible "musical" sound. As the number of vibrations of the stimulus increases, the modification of sensuous consciousness changes; our sensations run through what we call "a scale" of tones (from lower to higher, with a greater or smaller number of members to the scale, according to individual peculiarities and training). At from 20,000 to 40,000 vibrations all sensations of musical sound cease. If now we take a given number of vibrations, as 440 per second, in the German musical scale, and observe carefully the precise quality of the sensation evoked by it, we may fix one note in our scale (the a^1 of the musical scale). It will then be found that for ears which are not tone-deaf and are even moderately cultivated, the other sensations of musical sound will arrange themselves, with reference to this fixed note and to one another, in a peculiar way. Notes caused by twice the number of vibrations of other notes cause a peculiar, pleasant relation of sensations—similar and yet different—when sounded successively; they are octaves above, and the octave is the most "perfect harmony," as we say. In general, it will be found that the "clangs" have their peculiar tone-color in accordance with the mathematical relations of the partial tones which enter into them. Within any octave in the musical scale the eight different notes stand in the following ratios to each other:

Name	C:	D:	E:	F:	G:	A:	B :	C¹
Relation of single vibrations	1:	$\frac{8}{9}$:	$\frac{4}{5}$:	$\frac{3}{4}$:	$\frac{2}{3}$:	$\frac{3}{5}$:	$\frac{15}{16}$:	2
Relative number in a unit of time	8:	9 :	10 :	$10\frac{2}{3}$:	12 :	$13\frac{1}{3}$:	15 :	16

Thus the timbre of each clang and its place in the "scale" is seen to depend on the form of a complex sound-wave. Moreover, when two or more clangs are sounded together, the resulting sensation-complex is either a pleasant or an unpleasant modification of sense-experience, called a "chord" or a "discord." But chords and discords are determined by the mathematical relations in which the sound-waves occasioning the clangs that compose them stand to each other. The simpler these relations, the more perfect the consonance: Thus, Octave (1 : 2); Twelfth (1 : 3); Fifth (2 : 3); Fourth (3 : 4); Sixth (3 : 5); Major Third (4 : 5); Minor Third (5 : 6).

In the case of color-sensations, variations in quality run through the tints of the spectrum in dependence upon the number of the oscillations of the rays of light which, by falling upon the retina, occasion them. If we use Fraunhofer's lines to mark those portions of the spectrum where its principal colors appear purest to the central portion of the normal eye, and then number the oscillations in billions, we have the following scale: B (450); C (472); D (526); E (589); F (640); G (722); H (790). That is to say, the rays of light, so far as they affect us at all, up to and somewhat beyond 450 billions, occasion the various shades of Red; beyond 470 billions the sensation takes on a yellowish tone (Orange-yellow), and at about 526 billions, becomes what we call Yellow. The yellow grows greenish, and at about 589 billions Green definitely appears; the green turns bluish, and at 640 billions Blue begins to be seen. From here up to about 722 billions the colors between blue and violet are run through; then Violet appears; and beyond the violet, to some eyes a glimmer of lavender-gray. But in the case of colors, as in the case of sounds, the different shades of color are not sharply separated, but pass gradually into each other; *the flow of qualitative differentiation is, however, far less smooth and uniform in the case of colors than in that of musical sounds.*

Fifth: The Quality of Sensation depends upon the Time during which the stimulus acts upon the organism for the production of the sensation. In appreciating the bearing of this condition upon our sense-experience, several considerations must be taken into account. The "inertia" of all the end-organs is such that a certain minute time is always required for bringing them, under the action of the stimulus, to their maximum of intensity and definiteness of response. The time consumed by the end-organ of sense does not exactly correspond to that necessary for starting and stopping the resulting sensory processes in the brain; and it is on the basis of the latter, of course, that the different psychological conditions of sense-experience immediately repose. If, now, we turn to the psychical side, we find that no sensation, as such, reaches its maximum of intensity and perfectly, as it were, defines its quality, without lapse of time. We may say

even of *simple sensations: however instantaneously they appear to rise in consciousness, they are really growths or developments.* And in this brief process of growth, which all simple sensations undergo, *they pass through different phases.*

§ 10. The "inertia" of the nervous mechanism follows as a necessary deduction from its molecular physical constitution. Connected with this property is what the German investigators have called the "*Anklingen*" and "*Abklingen*" of nervous excitement. But the inertia of different end-organs of sense is extremely different. Under extraordinary circumstances some five hundred sensations of sound, due to the crackling of an electric spark, and about the same number of sensations of touch, due to contact with the teeth of a revolving wheel, can be kept apart (without "fusing," as we say) in consciousness. The inertia of the end-organs of smell and taste is enormously greater than this. The inertia of the organ of color-sensations stands between these extremes; it is somewhat different, however, for the different colors. Thus Cattell [1] found that the length of time necessary to distinguish the color-tones from a shade of gray corresponding in brightness, nine out of ten times of trial, was: for red, 1.28 σ; for orange, 0.87 σ; for green, 1.42 σ; for blue, 1.21 σ; for violet, 2.32 σ. The minimum of all was 0.6 σ for orange and yellow; the maximum, 2.75 σ for violet. This amount of time, it was held, must represent inertia in the nerve-tracts and in the brain as well as in the retina.

§ 11. All know that different smells and tastes require considerable time to define their respective qualities. Of course, in the active and continuous use of the organs of these sensations, what takes place is really a succession of sensuous impressions or states, in which one qualitative factor rises more and more clearly above the others in discriminating consciousness. The same thing is true when we try to discriminate the full and precise quality of a sensation of touch, or of musical sound, or of color, by dwelling upon it. But over and above all this is the fact proved by experiment, that changes of color-tone take place when the time of the action of the light is reduced to a minimum. Or, in general, we may say that *time makes up to some extent for deficiency in the intensity of the stimulus.* All such experience is, of course, connected with the necessity for time in all acts of discriminating judgment, and in the cerebral processes which accompany such acts. Moreover, our self-conscious experience with these sensations is that they do actually *grow*, in time, *into* the qualities they really have. The fact that reaction-time is lengthened when we have to recognize, not simply *some* sensation, but a sensation qualitatively defined as *a*, rather than *b*, points to the same truth. And if we are forced to make an exception in the case of rapidly succeeding sensations of hearing noises or being touched, we must remember that almost all concrete quality is then lacking to the sensation, and consciousness has sunk to its most purely passive or, as respects quality, least discriminating form of manifestation.

Finally, the Quality of every Sensation depends upon the Intensity of the Stimulus which occasions it, and thus upon the

[1] See Philosoph. Studien, iii., Heft 1, pp. 94–127. And Brain, viii., pp. 295–312.

resulting amount of nerve-commotion set up in the organism. The effect of increasing the stimulus upon the changes of quality in the resulting sensations is, doubtless, connected with the spreading of the nerve-commotion over contiguous minute areas of the nervous apparatus. Brighter lights, louder sounds, stronger tastes, smells, and pressures upon the skin, severer pulls upon the tendons or crowding together of the joints, and more strenuous use of the muscles, all involve a greater extension of excitement within both end-organs and brain. Such spreading of the excited areas mingles new factors with the resulting sensations, and so gives to the complex result a different shading of quality, if not markedly new characteristics. *In general, and in all our sense-experience, as we are able to evoke and observe it, the rule that quality depends on intensity seems to hold true.*

§ 12. Even in those cases to which we appeal most confidently for our impression as to the separableness of the quantity from the quality of sensation, the principle that the latter depends upon the former seems to hold true. By changing the intensity of a musical sound, its timbre is—as we have already seen—made to change. Let any one experiment by watching the alteration in the *quality* of his sense-experience as he sweeps a violin-bow over an open string with varying degrees of pressure. The more nearly "contentless" the sound becomes—for example, a mere noise not loud enough to occasion a decided tone of feeling—the less obvious this principle of dependence becomes. "Intense" sweet or sour, and "strong" bitter or salt, *are* really different sorts of sensations from those which we characterize by the same nouns when the adjectives "faint" or "moderate" precede them. The same thing seems true also of sensations of temperature and pressure; although in the case of all these experiences we have no language with which to mark those delicate shadings of quality which arise when the amounts of stimulus are increased.[1]

Here again, however, it is the case of the so-called "geometrical" senses, and especially of sight, which offers the most obvious application of the principle. A white of less intensity is not simply less white: it is a shade of gray. And by constantly diminishing the intensity of the light, we can shade the series through all grades of gray to black, which is certainly not a "less degree" of the same quality of sensation as white. Important changes in quality also take place in all the color-tones when the intensity of the light approaches either a maximum or a minimum. On the way to the maximum, red and green pass over into yellow; and when the maximum is reached all colors cease, and even homogeneous rays appear white. At the minimum intensities of light every color-tone, except pure red of spectral saturation, appears colorless. If we puncture a very fine hole in a piece of paper and look

[1] M. Bergson maintains (Les Données immédiates de la Conscience, p. 36) that "a heat more intense is really another heat." We call it more intense because we have a thousand times experienced the same change when we have approached a source of heat, or when a larger portion of our bodies was impressed with the sensation of temperature.

through it at a colored surface some six or seven meters distant, the color of the surface cannot be seen. But by increasing the number of holes at contiguous points, so as to allow more light to reach the eye, the color is made to define itself. On the skin it is even difficult to distinguish sensations of temperature from those of light pressure, when the stimulus is in both cases of a very low degree of intensity.

It will appear later how influential in forming that field of perception, in which muscles, skin, joints, and tendons, with central feelings of effort, combine, are the variations in quality occasioned by different amounts of the stimulation of these organs. For example, we have a *different kind* of sense-experience (and not merely *more of the same kind*), when a large muscle is acting, from that which belongs to the contraction of a small muscle.

By Intensity or Quantity of a Sensation we may be said to mean *the psychical energy with which the sensation is realized*, as it were—the "degree of its becoming in consciousness." This characteristic of all sensations obviously implies that they are in some sort measurable; the terms "strong" and "weak" may be applied to them; they may be compared and pronounced to be "greater" or "less" one than another. Of this characteristic we are as sure immediately as we can be of any characteristic of our sense-experience; indeed, the fact enters into all our language and into all those calculations so necessary to the continuous adjustment of conduct to circumstances, in order not only to live wisely, but even to live at all.

When, however, we seek to give scientific definiteness to our experience with the varying amounts of our sensations, we find ourselves involved in many perplexing inquiries. Our ordinary comparisons of the sensations belonging to the same sense are extremely indefinite. We classify the degrees of intensity roughly under the above-mentioned and other terms; but, although the minuter changes of degree are easily observable, if we attend to them, we are at a loss to state in strict mathematical language the results of our most delicate comparisons. When we come to compare sensations of the different senses with respect to intensity, all estimates approach a point where they tend to lose their meaning and to become absurd. For example, who shall say whether this sensation of musical tone is fifteen or sixteen times as great as the preceding one; or whether the depth of this shadow surpasses that of the other, in the proportion of ninety-nine to one or of a hundred to one? Who would venture to pronounce the greenness of the grass precisely one and a half times the olive of the evening sky; or the smell of the violet in his hand just three-quarters as strong as the flavor of his morning's cup of coffee?

§ 13. The discussion of the "measurableness" of psychoses in general, and so of the applicability of the "category of quantity" to our mental states, has been brought to a place of great prominence by modern experimental psychology. The attempt has been made, in illustration and defence or in criticism of "Weber's law" (and, indeed, in the entire pursuit of "psycho-physical science," strictly so-called) to apply the methods, terms, and formulas of mathematical physics to conscious states, and to factors of conscious states, as such. Nay, more: sensations and other forms of psychoses have been spoken of as though they were entities that can have some sort of existence when depressed below a "threshold of consciousness." Units of measurement have also been employed in a way at least to suggest that the investigator conceived of himself as possessed of some unchangeable measuring-stick—itself a quasi-mental entity—which might be applied to these mental entities, and that he could thus establish a mathematics of psychical energy, as such.

On the other hand, in strong reaction against such views of the devotees of psycho-physics, some modern writers have denied *in toto* that terms of quantity have any applicability to those data with which psychology primarily deals. Thus one author[1] maintains that only by a convenient figure of speech, a fictitious translation of what is *really quality* and *changes of quality*, into terms that apply to extension in space, do we speak of our feelings and sensations as "more" or "less" and "great" or "little." Thus it is always—this writer holds—a really qualitative progress in our feelings and sensations which we interpret in the sense of a change of size.

Neither of these extreme views is, in our judgment, wholly true to the facts of consciousness or to the history of psychological investigation. There is, of course, no such thing possible or even conceivable as a fixed standard, in the sense of some psychical entity or equivalent of such entity, which can be applied for the determination of absolute or relative quantities of psychoses. All that psycho-physics can do is to determine under what conditions discriminating consciousness decides that a change in amount of "realized sensation" has taken place. But, on the other hand, the fact that psycho-physics can do even this is based upon an ultimate truth of consciousness—namely: *different sensations are actually different as respects the way in which they answer the question, How much?* And if we are obliged to state our results in terms of "extensive" magnitude, this is only what is true of all our scientific dealings with the category of quantity. But, of course, whatever quantity psychoses, "as such," possess is "*intensive*" quantity, however obviously we may measure or express it in terms of the movement of the masses of our own bodies through space.

Any Theory of the Quantity of Sensations (in the only way in which such a theory can be framed, or indeed has any meaning) raises chiefly two sets of inquiries: (1) to find the quantitative limits—the *maxima* and *minima*—within which sensations of each sense are possible, and the laws of the variation of these limits; and (2) to determine the law of the relation under which

[1] M. Bergson: Les Données immédiates de la Conscience, p. 10 f.

changes in the intensity of sensations, as estimated in consciousness, depend upon changes in the intensity of stimuli. Many difficulties stand in the way of an exact solution of either of these inquiries; among which the chief are the difficulty of finding a precise standard of measurement (either objective or subjective), the difficulty of applying the stimulus to the organ so as not to introduce confusing concomitant experiences of different kinds, and the difficulty of calculating the results so as to do entire justice to the problem which it is attempted to solve.

§ 14. It is only with respect to sensations of pressure and of the muscular sense (and less easily those of hearing) that we can confidently establish a satisfactory objective standard with which to compare the energies of the action of different stimuli. The immediate stimulus of sensations of color and light being photochemical, and of largely conjectural nature, and the retina being habitually under stimulation from its "own light," experiments upon the quantity of visual sensations meet with difficulty at the outset. As to the very nature of the stimulus which acts in the production of sensations of taste, smell, and temperature, we are still too much in the dark to be satisfied with any of the existing forms of experiment. Furthermore, the greater the number of experiments in psycho-physics, the more obvious it becomes, *how immensely complicated are the conditions under which even the simpler estimates of our own amounts of sense-experience take place.* It is no fixed and simple thing which we are here measuring. That which is measured, and he who measures, is one and the same unceasing current of mental life. The thing weighed, and the scales, and the weigher, are all existent only as they are in and of that flowing current. All are different in the case of each individual man; an almost endless variety of factors combine, in changing proportions, to form every different sensation-state of the same individual.

All our sensations, as respects their quantity, fall between certain Limits, the distance of which apart may be said to define the range of Sensation, quantitatively considered. These limits differ for the different senses, for different persons at all times, and for the same person at different times and under different circumstances. Within these limits the minuter differences of intensity, as objectively measured, are discriminated with differing degrees of nicety. That is to say, *the number of sensations which have a recognizable difference as respects quantity, and which can be put in,* as it were, *between the limits, differs for the different senses, for different persons, and for different conditions of experience.* If then R = the range of sensation, S = the sensitiveness, and C = the capacity of each sense (or the amount of stimulus which it is able to receive): $\frac{C}{S} = R$, where $\frac{1}{S}$ stands for the measure of the sensitiveness.

There are two limits of sensation as respects quantity—a "lower" and an "upper;" these are the sensations corresponding to the least amount (the *minimum*) and to the greatest amount (the *maximum*) of stimulus to which the organism responds. In experimenting to find the lower limit, we may either select any small amount of stimulus somewhat above that needed to produce a sensation, diminish it very gradually, and note the exact point where it ceases to produce sensation at all; or else we may begin with a stimulus too weak to produce any sensation, and note the exact point at which, on its quantity being very gradually increased, it produces the least observable sensation. In all experiments to determine the lower limit, the almost ceaseless activity of the organs under intraorganic stimuli, and the fluctuations of attention, are the principal difficulties in the way of exact results. It is nearly impossible to determine experimentally the upper limit of sensation; for the highest intensities of stimulation endanger the organ, overwhelm the necessary discriminating attention, and bring in a confusing mixture of widespreading painful feeling.

§ 15. The facts as to the "lower limit" of sensation—or least amount of stimulus to which a response in sensation is given—are interesting chiefly as showing the marvellous delicacy of the nervous mechanism and the sensitiveness of the stream of attentive sense-consciousness to changes in the amounts of any of its factors. Experiment, however, shows chiefly how great the absolute sensitiveness of discrimination *may* become under the most favorable circumstances rather than how great it ordinarily *is*. Earlier results (Aubert and Kammler) made the lightest weight which produced a sensation of touch to be 0.002 gramme on the forehead and temples, and 0.005–0.015 gramme for the volar side of the fingers. By placing weights on the chest and calculating the energy then necessary to expel the air from the lungs, it has recently been found [1] that the coefficient of sensibility for the muscles used in respiration is very low (about 1 : 100) compared with that of the muscles of the limbs and trunk. A movement of the eyes, answering to a contraction of the inner muscles amounting to .0006 millimeter, can be detected. The sensitiveness of the skin to changes of temperature under the most favorable circumstances (that is, when the changes lie nearest the zero-point of the skin itself) is scarcely equalled by a good quicksilver thermometer (say $\frac{1}{5}$° Fahr.). It is greatly reduced by both heating and cooling the skin. It varies from about 0.2° for parts of the upper and lower arm, to 1.2° for the middle of the back. The ear is almost incredibly sensitive to acoustic stimulus; for it has been calculated that mechanical work done upon the ear-drum equal to not more than $\frac{1}{11}$ billionth kilogrammeter (the noise made by a cork ball of 1 milligramme weight falling from a height of one millimeter) will occasion, as an extreme *minimum*, a

[1] By Langlois and Richet, in experiments which will be referred to again, as having a bearing upon volition. See Rev. Philosoph., 1890, p. 557 f.

sensation of sound. And in light, $\frac{1}{100}$ of that reflected from white paper under the full moon was given as a lower limit by Aubert. While, if we test the intensity of the mixtures necessary to excite sensations of taste and smell, we find that many persons can detect one part in about 200 of sugar, one in about 2,000 to 3,000 of sours and salts; and even one part in 392,000 (quinine) or even 1,280,000 (strychnine) of some bitters. A substance called mercaptan has been smelled when mixed in volumetric proportion to air of one to 50,000,000,000—an absolute amount of about $\frac{1}{1000000000}$ milligramme.

As might be expected, extreme instances of defective or of acute senses are revealed by experiment, as well as certain idiosyncrasies of sense. While the discriminating sense of taste is finer for most substances in women than in men, that of smell is, in general, less fine.

It is to this marvellous delicacy of sensation that we must look for an explanation of the power to acquire that superiority of tact and skill in sense-discrimination of which man is capable. By cultivation and practice the realm of intuitive perception, which takes place without conscious reason, and is to the knower himself quite inexplicable, is enlarged upon this sensuous basis. Here also it is not unlikely we may expect to find, in part at least, an account for those alleged powers of divination and telepathy, which researches in modern hypnotism are bringing to view.

The search for some exact Statement of the Relations between estimated intensity of sensations and changes in the amounts of stimulus as objectively measured, has led to what is known as "Weber's law," or the "law of Fechner." This so-called law may be stated equally well in either one of several different ways: The difference between any two stimuli is experienced as of equal magnitude, in case the mathematical relation of those stimuli remains unaltered; or, If the intensity of the sensations is to increase by equal absolute magnitudes, then the relative increase of the stimulus must remain constant; or, The strength of the stimulus must ascend in a geometrical proportion, in case the strength of the sensation is to increase in an arithmetical proportion.

The proof of Weber's law implies that some standard for exact measurement of the quantity of sensations shall be discovered, and that this standard shall be applicable, not only to sensations of the same sense, but also to sensations of the different senses. Now, that we cannot accurately estimate—in a direct and absolute way—the amounts of our sensations, has already been pointed out. When, however, two sensations of nearly or quite the same quality are brought into proximity in consciousness, we can, under certain circumstances, estimate with great nicety minute differences in the amounts of the two sensations. "The least observable difference"—or smallest amount of change in

the stimulus which will cause a detectable change in the quantity of the resulting sensation—may then be used as our standard of measurement. This "least observable difference" is obtainable in several different ways (such as the "method of mean gradations," "method of minimum changes," "method of average error," "method of correct and mistaken cases"), which cannot be described here.[1] By thousands of experiments upon all the different classes of sensations, and under the greatest variety of conditions, the attempt has been made to form a scale of quantitative changes in sensation as dependent upon increasing and diminishing the amounts of stimuli. Thus it is hoped to confirm or to correct "Weber's law." Among the workers in this line Fechner is most distinguished, and by his name the "law" is also called.

§ 16. Professor Jastrow[2] and others have pointed out that the value of Weber's law depends chiefly on its furnishing a means for comparing the sensibility of different, otherwise incommensurate, senses. The law can be formulated in a number of different ways, depending upon the different methods used in experimentation. For example, as formulated in terms of the method of average error, we may state it in the following way: The probable error in our estimate of the amount of our sensations is uninfluenced by a change in the *absolute* size of the stimulus according to which the adjustments are to be made. That is—to give a concrete case—suppose that, in testing weights, the least observable difference (or "threshold") is $\frac{1}{10}$; then, if the law be strictly true, it follows that one will not err oftener in judging between 30 oz. and 30.1 oz., or between 30 oz. and 30.5 oz., than between 30 oz. and 31 oz. This is, however, not antecedently probable, and is also found by experiment to be untrue. The law is, therefore, only roughly and approximately correct.

§ 17. The chief contribution of Fechner to Weber's law was made by regarding the "least observable difference" between the intensities of two sensations as a sort of constant quantity, an invariable "sensation-mass," as it were, which could be applied for the measurement of sensations, and so for assigning them positions along a scale of quantity. But it must be understood that nothing either of a physical or of a psychical nature corresponding to such a unit of "sensation-mass" can possibly exist. For example, if the addition of n to the stimulus S is the least possible amount which will so change the sensation-state x as to cause it to be succeeded by the sensation-state x^1: and the latter is discriminated as just greater in quantity than the former ($x^1 > x$): then such facts of experience deserve recognition. But it does not follow that we may say $x^1 - x$, or "least observable difference," $= \Delta$, and then treat Δ *as though* it were a sort of *psychical* entity measuring changes of *psychical* conditions. For there is really only the sensation-state x^1, now present in consciousness, and estimated as just a

[1] See the author's Elements of Physiological Psychology, p. 364 f., and the works referred to in its notes.

[2] Am. Journal of Psychology, Feb., 1888, p. 298 f.

little greater than was x an instant since. Or, rather, *what really happens in consciousness is the process of discriminating a change of amount in one direction or the other.* But Δ is a mere abstraction, a figment of the experimenter's imagination. In other words, *there is no such physical or psychical reality as a "least observable difference."*

Experiment confirms what ordinary experience makes familiar, namely, that the consciously estimated amount of our sensations varies in dependence upon the increase and diminution of the amount of stimulus applied to the end-organs of sense. But it also establishes the truth that the psychical variations of intensity depend upon a great variety of conditions besides those set up directly in the end-organs by the application of stimulus. So far, however, as we can isolate this one condition, we learn that it is the *relative*, and not the absolute, amount of the stimulus applied to the end-organs which determines the discernible increase or diminution in the amounts of sensation. And here, for several of the senses, at least, when the sensations are of fairly moderate intensity (or, as we should express it more technically, in the "median parts" of the scale, and not too near the upper or the lower limit), the law of Weber is approximately correct. That is to say, in order to produce an appreciable change in the intensity of any sensation, we must in general add to or subtract from the stimulus a nearly uniform proportion of the amount producing the particular old sensation with which the new one is to be compared. But this rule, even when stated in so loose and indefinite a manner, does not apply to sensations that are either very weak or very strong. Moreover, we find difficulty in establishing it at all for some kinds of sensations, and for all kinds under some circumstances.

§ 18. What is sometimes called the "quotient of sensitiveness" $\left(\frac{1}{S}\right)$ varies for the different kinds of sensation; and this fact the law of Weber admits and makes use of in its experiments and proofs. Weber himself found that weights which differ as 29 : 30 can be distinguished by the pressure they cause when laid on the volar side of the last phalanges. If we are permitted to raise and lower them, the quotient of sensitiveness rises to 39 : 40. Subsequent observers[1] have found that this quotient for estimating weights, instead of remaining constant, as Weber's law would have it, varies from $\frac{1}{31.3}$ for weights of 300 grammes to $\frac{1}{53}$ for weights of 3,000 grammes. The quotient of sensitiveness to pressure has been found by other experimenters to vary from $\frac{1}{14}$ for weights of 10 grammes to $\frac{1}{17}$ for weights of 400 grammes. Later experiments show that in our comparison of weights which we are permitted to lift, the speed with which we judge ourselves to

[1] Comp. G. E. Müller: Zur Grundlegung d. Psychophysik, p. 197. And Biedermann and Löwit: Sitzgsbr. d. Wien. Acad., lxxii., Heft 3, p. 342 f.

be raising the weights, in comparison with the effort we put forth, is a determining element in the experience.[1]

In discrimination of the intensity of noises and musical sounds, the so-called law holds only very imperfectly; for the quotient of sensitiveness varies greatly for different places along the scale. Weber's law is true only approximately for a part of the musical scale. Thus, if we assume a certain convenient measure of intensity of the stimulus as a unit (an extremely weak stimulus near the "threshold"), the quotient of sensitiveness for tones remains about the same ($\frac{1}{100} - \frac{1}{110}$) until we have increased the original stimulus by multiplying it by ten some five times over; but then this quotient begins rapidly to rise, and it finally attains more than twice its former degree of sensitiveness ($\frac{1}{210}$). In auditory sensations, too, it is found that the order of succession has something to do with the result; thus one observer found that, of two successive sounds of equal quantity, the second regularly seems greatest.

It is, of course, by experiment with visual sensations that the most numerous attempts have been made to demonstrate Weber's law. The experience of astronomers, which shows that the magnitudes of the stars are not to be classified by their absolute brightness, had much to do with the earlier discussions of this law. Weber fixed the quotient of sensitiveness to brightness at about $\frac{1}{100}$. If, for example, we cast a shadow by lighting any opaque object with a candle set at a given distance from it, the difference between the intensity of this shadow and one cast by two candles of the same luminous power is discernible when the second candle is set behind the first at ten times the distance of the first candle from the object. Under the direction of Fechner, experiments were conducted by A. W. Volkmann and others, which seemed favorable to Weber's law. But subsequent investigations have not shown so favorable a result. The quotient of sensitiveness has been found to vary from $\frac{1}{60.6}$ for weak intensities of light to $\frac{1}{167}$ for stronger intensities. Later observers have confirmed the variable nature of this quotient, and have even seemed to indicate that it is not precisely the same for different colors. Indeed, the complicated nature of this apparently simple inquiry becomes more apparent. The effect of background is enormous; the extent of lighted surface influences the mind; the order of the succession of the two lights compared has something to do with the solution of every such problem in comparison; the focusing of the eye is not to be disregarded, nor the reflection of light from surrounding objects, etc.

What is true of all these classes of sensations apart is also true of them when combined for the estimate of sizes and distances. Where comparison takes place in connection with a "sort of impressionist reception of the gross sensation without dividing it up in our minds,"[2] something like Weber's law seems to hold true. *But in all complicated and nice comparisons of quantity, and so in all judgments of size and distance, we use a number of different data as a basis for the wonderful "tact" which it is possible to attain.*

The detailed description of the attempts made to apply Weber's law to sensations of temperature, taste, and smell would be of little value to an understanding of mental life. From the very nature of the organs of these

[1] G. E. Müller and F. Schumann: Pflüger's Archiv, xlv., p. 106.

[2] See Professor Jastrow, in the Am. Journal of Psychology, Jan., 1890, p. 44 f.

senses, and of the stimulus which excites them, accurate experimentation is peculiarly difficult, if not impossible. And it is not to be expected that a so-called law which cannot establish itself firmly on a basis of those sensations where discrimination, in respect to quantitative changes, is highest, should derive much help from those where discrimination is at a minimum.

The Meaning of "Weber's law," in so far as we are led to admit its accuracy in furnishing a summary of the facts of experience, may have several interpretations. Its great advocate, Fechner, understands it as a most general psycho-physical principle; that is to say, the law—he holds—states the highest and most universal relations which prevail between the physical and the psychical aspects of our compound human life. But a saner view of the facts considers the explanation of this relation between sensation and stimulation as chiefly physiological. In all cases the end-organs profoundly modify the intensities of the stimuli they receive. It is probable that whatever is true as respects the "logarithmic" character of the relation holds between the stimulus and the resulting amount of neural excitation. Between the neural excitation, after it has reached the brain and been set up there, and the psychical result in sensation, the relation is probably one of direct proportion. But, above all, is it necessary to remember that other conditions than mere changes in the objective quantity of the stimulus always determine our estimates of the amounts of resulting sensations; and, in general, *stimuli and sensations are not connected quantitatively in such a simple manner that we can measure one off in terms of the other.* Nor do we mean the same thing by terms and standards of quantity when we talk, on the one hand, of intensities of sensations, and, on the other hand, of amounts of physical stimuli. And, finally, when we give to Weber's law a purely psychological interpretation, we find it falling under the general principle of all mental life, namely, that every mental state has its value determined by its relation to other contiguous mental states.

[The literature called forth by the discussion of Weber's law is very large. Besides the great monographs of Fechner—Elemente d. Psychophysik (1860), In Sachen d. Psychophysik (1877), and Revision d. Hauptpunkte d. Psychophysik (1882)—and of G. E. Müller: Zur Grundlegung d. Psychophysik—important contributions have been made, among others, by Wundt: Physiolog. Psychologie, I., chap. viii. Stumpf: Tonpsychologie, I., i., § 3. Articles in the Philosoph. Studien, by Lorenz, ii., pp. 394–474, and 655–657. J. Merkel, iv., pp. 117–160; 251–291, and 541–594; and v., pp. 245–292. Starke (1886), iii., pp. 264–304. Luft (1888), iv., pp. 511–540. Lehmann and Neiglick, iii., pp. 497–533, etc. Köhler (1886), iii., pp. 572–642. Thorough and unfavorable criticisms have been published by Delbœuf: Éléments de Psychophysique (1883). Tannery: Revue philosoph., Jan. 7, 1884, and Feb., 1888. And Elsass: Ueber die Psychophysik (1886), and Philosoph. Monatshefte, xxiv. and iv. Brief accounts in English may be found in Ladd: Elements of Physiological Psychology, pp. 356–381. And James: Principles of Psychology, I., pp. 533–549.]

CHAPTER VIII.

SENSATION-COMPLEXES AND LOCAL SIGNS

It has already been shown that none of our most elementary sense-experiences are really simple and ultimate, if we mean by these words an unanalyzable result in consciousness of the excitation of a single nervous element. Even the "simplest" sensations are the psychical equivalents of a simultaneous excitation of *many* such elements. Nor in our ordinary experience do all the elements simultaneously excited even belong to the apparatus of the same specific form of sense. And, if we attend to the phenomena of consciousness, we do not find that any of our sensations are wholly *pure* examples of one elementary kind of sense-experience to the exclusion of all admixture from every other kind. Thus, for example, sensations of taste are not experienced as unmixed gustatory phenomena. When we taste, we also smell and touch; and what *the* taste is to us, as we get it from any particular substance, is a "sensation-complex" composed of gustatory, olfactory, and tactual elements. Other obscurer forms or modifications of sensation, arising from the excitement of the alimentary canal lower down, and even associated images of memory and imagination, blend in our so-called "sensations of taste." But we call the entire experience by this name—sensations of *taste*—because the predominating characteristic is given to the sensation-complex by the gustatory sensation. The same thing is true of all our seemingly most elementary sense-experiences.

Our subsequent treatment of perception will show how discriminating consciousness handles, as it were, this exceedingly complex and variable material of sense. At present it is our purpose, however, to speak of those more primary "fusions" of the simpler sensations which result in the elementary kinds of sensation-complexes, and which thus form "data," as it were, for discriminating consciousness in the construction of spatial perceptions. And here the general principle may be stated as follows: *All our sensations, in so far as they form the basis of perception* (the immediate knowledge of things through the senses),

are mixtures of sensation, which have an indefinite variety of compound characteristics; but which also have—each one in particular—some specific sensuous character that is prominent in the compound. Now, let us suppose that these "mixtures" of sensation depend, for the number and proportion of the elements or factors which enter into them, upon the locality in the external organs of sense, by excitation of which they are occasioned. We have then the foundation laid for a theory of so-called "local signs." This theory may be stated as follows: *The total compound characteristic of every distinguishable mixture of sensation* (or "sensation-complex") *depends*—in part at least—*upon the locality of the organ where the excitement occasioning that particular mixture originates.*

The subsequent discussion of perception will show how sensation-complexes, by their indefinite variety, afford "signs" to discriminating consciousness by means of which they become assigned, each to its proper locality, in that system which the term "field of perception" represents.

§ 1. The whole construction and activity of the nervous mechanism provides, inevitably, for the fusion, from the very beginnings of consciousness, of the different sensation-factors, or so-called simple sensations. Even if the organs of sense were immovable, this would be in no small degree true. In the case of a motionless retina, as we have already seen, the result of the excitement of any group of elements is a modification of consciousness which may assume any one of a number of minuter shadings of color-tone. The anatomical and physiological reason for this is found in the integrity and unity of the organism itself and in the fact that no part of it can perform its functions in an isolated way. The case of the skin illustrates the same truth even more obviously. Any object laid upon the passive hand, for example, excites an indefinite number of pressure-spots; and not only this, but temperature-spots, and superficial muscle, and active resistance to this lightest pressure, are likely also to be simultaneously evoked.

But, as a matter of fact, from the very beginning of consciousness the organs of sense are *not* motionless; on the contrary, they are ceaselessly in motion, whether in an impulsive and reflexive, or in a purposeful and voluntary way. This fact provides a sort of universal solvent, or menstruum, as it were, in which the various allied factors of sensation are mixed and fused. Motion of the sense-organs induces constant changes in the compound quality of those sensation-complexes which originate in excitement of different considerable areas of the end-organs of sense. Motion is also itself a fact significant of the reaction of psychic life, in primary acts of volition, upon the stimulus of the periphery of the body. Apparently also we, from the first, *sense* this activity, at least in some inchoate and obscure way.

§ 2. Two things should be noted, in addition to what has already been said, regarding sensation-complexes characterized chiefly by sensations of

taste and smell. First: These sensation-complexes may be characterized by the relative amounts of either passive or active consciousness which enter into them. If, for example, one holds any gustable substance in the mouth, and suppresses all motion of the organs whatever, one has a sort of diffused and dull sensation-complex, which is a compound of gustatory, olfactory, and tactual sensations, with the gustatory sensations mildly predominant. By directing attention to the organ—still, we will suppose, without moving it—one can make more prominent either of these kinds of sensation. To a certain extent one can thus analyze the taste of a substance, and determine what kind of aroma or spicy flavor it possesses, or how it feels in the mouth. But if we make this analysis in the more natural way, we begin to move the substance about with the tongue; we press it against the gustatory end-organs and let its effluvia rise to the olfactory organs through the back of the mouth. In doing this we naturally neglect the change in our sensation-complexes which is due to the admixture of active touch; for it is the taste and flavor of the substance which we wish to explore. Nevertheless, a modification of our sense-consciousness, due to the introduction of elements of active touch, inevitably takes place; things have a different taste and flavor when tasted actively from that which it is possible to produce by merely passive taste. The same thing might be shown to be true of smell. Our experience with both classes of sensations is very instructive respecting the value of all sensation-complexes. For example, we may be thinking intently while at table, or reading diligently in a room where a lamp is smoking, or a bunch of violets exhales its odor. The sensuous complexion, agreeable or disagreeable, of our mental life is kept suppressed by the fixation of attention to a given train of ideas. But after more and more strongly asserting itself—the sensations struggling, we might say, to raise their heads for clear recognition above the threshold of consciousness—the sensuous basis breaks up into the mental train and wholly destroys it. We begin actively to inquire, by moving the tongue or snuffing with the nostrils, as to what *is* this nasty or pleasant taste, this horrible or agreeable smell. In general, then, sensation-complexes of smell and taste depend not only upon the qualities and intensities of the olfactory and gustatory sensations, but also upon the muscular and tactual factors that enter into them. Even hot lemonade of the same degree of sweetness does not "taste" quite the same as cold.

Second: It is through admixture with other sensations that sensations of smell and taste come to attain the *massiveness* or "*extensity*" which we attribute to them. Mixtures of sensation—chiefly taste or smell, and called by one or the other of these names—differ in a very important way when called forth by excitement spread over large areas of the organ. Here the testimony of consciousness is immediate and conclusive. With one's mouth full of sugar, or one's nostrils full of the odor of heliotrope, one is not affected, sense-wise, as one is with a trifle of sweet laid on the tip of the tongue or a suggestion of the flower's presence from a distant bouquet. Nor is this difference fully expressed in terms of varying quality and quantity as applied *solely* to gustatory or olfactory sensations. On the other hand, such "massiveness" is plainly a derived and secondary characteristic due to the admixture of tactual and muscular elements. We find, then, no

occasion to apply extensive magnitude, or bigness, to sensations of taste and smell, "as such;" we cannot even form the faintest conception of what is meant by such an attempt. The "bigness" of sweet and sour tastes, or of asafœtida or sulphuretted-hydrogen smells—this is a term which has no meaning. When, then, Dr. Ward speaks[1] of "extensity," or spatial bigness, as belonging, like quality and intensity, to all kinds of sensations, and Professor James[2] entertains us by remarking that "the pork tastes more spacious than the alum or the pepper," and that the odor of vinegar is "less spatially extended" than that of musk, they appeal, indeed, to indubitable experience; but they do this in support of a theory which is simply inconceivable. *All our senses are exercised in such connection as to call forth data which serve for making spatial distinctions; but not all sensations have "extensity," as sensations.*

§ 8. Among all sensations those of hearing are freest from original and inextricable mixture with other kinds of sense-experience. If we imagine the effect upon consciousness which would come from a perfectly passive reception of auditory impressions, we seem to ourselves to have discovered what we are in search of, namely, sensations that, without any influence from blended sensations of another kind, recur in consciousness with varying qualities and intensities. But, however possible it may be to imagine such a "pure" sense-consciousness of tone, all this is very different from our actual experience with sensations of sound. Not only are all such sensations compounds of noises and tones, but they are also, as actually experienced, fused with a variety of sensations of other than the auditory kind. In hearing noises of considerable intensity, the vibrations of the masses contiguous to the proper organ of sound are also felt as tactual and muscular sensations. The noise made, for example, by a slamming door or a cannon shot off is not by any means "pure" auditory sensation. If we abstract the sensations caused by the assault of the air-waves on the external membranes, with the actual extension of these sensations over wide areas of the membranes, and the shudder that runs through the entire body—the muscular reverberation, as it were—then the auditory sensation-complex loses its characteristic "massiveness." It is in these very admixtures of tactual and muscular sensations that the so-called massiveness of the sound consists. A person sitting with the back closely pressed against a board that is in contact with a grand organ being played, knows that—to speak accurately—he *hears* the massive sounds with head and spinal cord and vibrating molecules through the entire mass of the upper trunk. Again, the terms "high" or "low," as applied to the place of notes in the musical scale, really refer to the visual, muscular, and tactual sensations which fuse with the auditory when we are sounding, imagining, or reading the different notes. As *pure* sensations of sound, the pitch of notes has nothing to do with high or low.

Furthermore, in all active attention to sounds—and *some* attention goes with all hearing of sounds—motor adjustment of the organism takes place; the reflex influence of this, if not also its direct influence, enters as a factor into the resulting sensation-complex. The sound heard when we listen with

[1] Art. Psychology: Encyc. Brit. (ninth ed.), pp. 46 and 53.
[2] Principles of Psychology, II., p. 169 (note).

strained attention is a different modification of our sense-consciousness from the sound passively heard.

It is probable also that obscure sensations derived from changes in the fluids of the semi-circular canals, and connected with the localization of sound and with the orienting of ourselves in space, fuse with the other elements to make up that total complex of sensations which we describe as the hearing of some particular sound "over yonder" or "near by."

§ 4. Sensations of color and light never arise in our adult consciousness as "pure" sensations of this particular kind. It is not with the retina alone that we see; and seeing, even in the simplest form possible for us, is something much more than merely having sensations of light and color. In those sensation-complexes which we call by the names that mark their prominent characteristic (namely, the color of red, green, blue, etc.), there always blend the resultants of past and concomitant sensation-factors due to movement of the lenses and of the entire eyeball. Upon these concomitant factors the visual sensations are largely, or wholly, dependent for their "massiveness" and "locality." For example, let us close the eyes, and thus exclude as far as possible the more highly developed "judgments" which enter into the localization of objects and the perception of their size and spatial qualities when seen with open and moving eyes. A "sensation-mass" of indefinite proportions, of somewhat vague localization—"in front of the eyes," as we say—and of varying qualities and intensities of color-tones, sums up our dominant sense-experience. This sensation-mass is due to the simultaneous excitement of a vast number of retinal elements through the photo-chemical changes that constantly accompany the circulation in the blood-vessels of the eye. It seems to be simply received upon a motionless eye. It is the very clearest type of a pure, passive, and yet massive and extended sensation-complex. Let us try, however, to look at any particular part of this sensation-mass—we will say at the upper right-hand corner—and we become aware that this is accomplished by exceedingly minute movements of the eyes. We are thus evoking the tactual and muscular sensations which *must fuse* with those of color and light in order that the latter may appear as belonging to a particular part of the entire mass. And if we wish further to see this sensation-mass itself move right or left, up or down, we must move the eyes and even the head in the appropriate directions. This means that we really see it move, by means of the tactual and muscular sensations belonging to moving eyes and head and upper trunk. It is probable that the mere focusing of attention upon any color-mass, necessary to bring it into consciousness at all, is accompanied by sensations and memory-images of sensations which belong to the tactual and the muscular sense.

In all ordinary experience with the eyes, however, we have the sensations of color and light unceasingly fusing with tactual and muscular sensations due to changes in accommodation and to movement of the eyeballs. Indeed, what we call sensations of color and light consist of such complex visual sensations, due to the total activity of the eye, in which color and light are the most prominent factors, and those of touch and muscle are relatively disregarded or sunk out of sight. In other words, we never have sensations of color and light which are not experienced with the eye executing a certain movement, or after having arrived at a certain position, or while antici-

pating a certain movement with the intent to explore more carefully some other colored object in another position of the field. Translating all this into subjective terms, it means: *all sensations of light and color are experienced, not as "pure" and apart, but as fused with tactual and muscular sensations, such as belong to unfinished, or just completed, or anticipated movements of the eye.*

§ 5. That the various sensations, due to irritation of the nerves terminating in the skin, muscles, and joints, fuse into a great variety of sensation-complexes, no psychologist can doubt. These specifically different affections of our sense-consciousness habitually and necessarily occur in the same unity of a state of sensation. Moreover, they all make their contribution to the solution of the same problem which is constantly before discriminating consciousness. The very existence and development of mental life depend upon our getting information as to the positions and movements of our bodily members, relative to each other and to their environment, and as to the qualities and movements of those objects with which these members come in contact. *Skin, joints, and muscles are, from the first, and without cessation, forced into the closest copartnership of activity.*

That particular kind of these closely allied sensations which predominates in the complex result, or which is most closely allied with the practical end aimed at, will give its characteristic tone and name to the total sense-experience. For example, if the predominating sensation be one of temperature, we disregard the fact that our experience is a compound of heat-sensation *with* sensations of light pressure and perhaps muscular sense. But, if it is chiefly one of *light* pressure, we disregard the muscular factors, and speak of the object as "feeling smooth and hard." Or, again, we may note that the object seems "heavy" by attending only to the strain produced in the muscles and joints and overlooking the condition of the skin.

In all these sensation-complexes certain characteristic differences between the purely tactual and the purely muscular sensations are of no little account. These differences serve to characterize different groups of our sense-experiences, and so to determine the place they have in constructing the "field of perception;" although both skin-sensations and muscular sensations enter into each group. The skin is passively "affected," for the most part, by having its different areas more or less severely pressed upon. The muscles are "exercised," for the most part, in the movement of the limbs or in the innervation and muscular adjustment of the organs of sense. But the muscles, too, may be passively affected by pressure of heavy masses laid upon the skin. Indeed, it is doubtful whether our muscles can hold themselves perfectly still when provoked to motion by even a small amount of pressure. On the other hand, when the muscles are active, the skin which is stretched over them, or which is in contact with the object being explored, keeps pace, in some sort, with the flow of muscular sensation. Rarely or never do skin and muscles function apart; rarely or never, therefore, does there fail to be a fusion of tactual and muscular elements in sensation-complexes of this class. Nor are sensations of the joints and of temperature likely to be far off from the total sensation-mass.

§ 6. In this connection the physiological fact must be emphasized, that the excitations of the muscles come regularly by centrifugal paths; while in

the case of the other senses this happens rarely or not at all. Hence muscular sense is preëminently the *active* sense; and, according as it enters into all the various sensation-complexes, it imparts the quality of activity to them all. It converts seeing into looking, hearing into hearkening, passive into active touch. And yet there is something always vague and contentless about it—something of the nature of indefinite feeling (*Gefühlartiges*), it has been said. Muscular sensation is more obviously connected, and more firmly fused, with sensations of the skin than with those of any other sense. And yet it resembles hearing, in being a kind of interior sense; whereas the skin resembles in objectivity the sensations of the retina. Yet, again, muscular sensation is the factor necessary to fuse with sensations of light and color, in order to give them massiveness and spatial extension, as it were.

When we allow time for the Development of Sensation-complexes, by running quickly through a number of changing phases, we disclose certain classes of our sense-experience which seem to stand midway between sensations and perceptions of sense. These are really instances of that indescribably quick and acute "tact" which belongs to all mental life in the interpretation of the meaning of changes of sense-consciousness. In the case of the lower animals such tact often takes the form of what we are accustomed to call "instinct." In the case of man it is more likely to mark stages reached only as the result of much experience. But in man's case, too, hereditary tendencies and aptitudes are of the greatest influence in this sphere. "Natural tact," so-called, or the sensing of the meaning of sensation-complexes in immediate connection with the having of the sensation-complexes themselves, is not foreign to the earliest development of human mental life. So far as serves our present purpose, we shall consider it, chiefly, in these two forms: so-called "sensations of motion" and so-called "sensations of position."

Sensations of Motion, so called, are evoked by stimulating closely contiguous nervous elements in the peripheral areas of the retina and of the skin with its accompaniment of muscular and joint sensations. The other senses do not, in themselves, respond to stimulus with similar sensation-complexes. That is to say, sensation-complexes of taste, smell, and hearing, without mixture of factors derived from stimulation of the connected portions of the skin and muscles, are lacking in the qualities distinctive of so-called "sensations of motion." The psychical characteristics of this class of sensation-complexes are a certain relatively smooth and continuous change in the compound quality of the mixture, whenever the change takes place in a minute portion of time. In other words, *sensation-complexes of the eye and of the skin* (including muscular and joint activity), *ex-*

perienced as changes of compound quality, are immediately and instinctively interpreted as "sensations of motion."

§ 7. "*Sensations* of motion" are distinguished from perception of motion, in that the latter requires more of conscious and deliberate discrimination, and of comparison of data, with a view to estimate or judge the proper relations attributable to the data compared. And yet the difference here is, as elsewhere in all the development of mind, a difference in the degree of intelligence and purposeful control with which the exercise of essentially the same fundamental faculties takes place. It accords with the very necessities of animal life that sensations of motion shall play an important part in the preservation and development of the individual and of the species. In the case of all the lower animals, and also in the case of man, so far as his preservation and development depend upon himself, the quick and accurate "interpretation" of these modifications of consciousness is a chief element in determining the so-called "survival of the fittest." To sense danger and to sense the presence of its prey are indispensable for the animal. But what is dangerous, and what is disagreeable or good for food, *moves* nearer to or farther from the body, or over its surface (for example, when tasted, smelled, or touched). As a matter of fact, all animals, including man, are in a high degree sensitive to those changes in their sensation-complexes which are significant of motion. In man's case it is a difficult thing to say how much of this sensitiveness, so far as it consists in *interpretation* of the fact of motion, is present from birth, and how much is acquired. But if we remember that discriminating consciousness belongs to all the earlier activities, and that no sensation-complexes are had without this activity entering into their very constitution, as it were, we shall conclude that even this seemingly "natural tact," or "knack of interpretation," marks almost from the beginning the unfolding of man's mental life.

§ 8. The motor sensations of the skin and the sensitiveness of its different areas may be experimentally tested. In general its discriminative sensitiveness to motion is much greater than to mere pressure. Experiment[1] showed that the motion of a metallic point, travelling at a rate of 2 mm. per second, could be discriminated when it had amounted to 0.20 mm. on the forehead, 0.40 on the upper arm, and 0.85 on the back. These distances are much smaller than those necessary for the discrimination of separate pressures. But motion *can be* produced so slowly as not to be discriminated at all, even when the point has travelled from 6 ctm. to 12 ctm. This means that unless the change in the sensation-complex is great enough to be discriminated within a given minute portion of time, no sensation of motion occurs. For, as we have already said, *sensation-complexes must change their compound quality discernibly in order to be interpreted as "sensations of motion," so-called.* In accordance with the same principles are the facts that heavier weights *seem* to move faster than light ones, and that the rate of motion depends upon the number and quality of the pressure-spots in the area of the skin over which the motion occurs: for heavier weights call out other sensations, by deep pressure, which aid in discriminating the changing sensation-complexes; and the rapidity and amount of

[1] By G. Stanley Hall and Donaldson. See Mind, Oct., 1885, p. 557 f.

change in these sensation-complexes depends upon the character of the pressure-spots simultaneously and successively irritated.

Sensations of motion also originate in changes imparted to the compound quality of the sensations, chiefly by the irritation of the joints. In other words, we "sense" motion with our joints, in some degree. Even passive bending of the finger is discriminated, chiefly through joint-sensations, according to Goldscheider,[1] when the motion is not more than 0.60° to 1.74°. A swing of the arm, with a minimum velocity of 0.30° to 0.35° in a second of time, is said by the same author to be discriminated as a sensation of motion (chiefly by the shoulder-joint) when it amounts to 0.22°–0.42°.

That the active movement of the muscles is accompanied by such a modification of consciousness as we interpret into sensations of motion has already been affirmed in our treatment of muscular sensations, as such. We have also seen that the discriminative sensitiveness of different muscles varies very greatly. For example, the difference is enormous between the muscles of the eye and those which control the process of respiration. Modern research has, moreover, rather tended to assign a relatively small part to the muscular elements in our sensations of motion. Some observers, however, have made the bold attempt to resolve all differences in our motor sensation-complexes, even those of a quantitative order, into differences of muscular tension. Between the two extremes the truth probably stands. All sensations of motion are by no means to be reduced to muscular elements; but we do "sense" motion by the changes in our sensation-complexes due to elements contributed by the varying degrees of muscular contraction and tension. And, if need be, we can, with some of the muscles, accomplish this with a high degree of discriminative sensitiveness.

Visual sensations of motion, with an immovable eye, may be produced either by stimulating contiguous elements of the retina in close succession or by stimulating the same group of elements with closely successive different color-tones. To understand how this takes place, one has only to close one's eyes, and, keeping them motionless, watch the rapid motions which appear in the different portions of the color-mass. The drifting mist of brightly-colored points, or shifting of the color-scene in kaleidoscopic fashion, is not, of course, due to the objective movement of colored objects across the field of vision. It is the *sensing* of motion as interpretative of certain changes in our sense-experience of the qualities and intensities of color and light. It is the same experience as that which, in a more elaborate and deliberate way, makes us "see" the sleeping cat or child in the picture actually open its eyes when we change, with the right speed, the object as it appears in reflected light (the colors on the front of the paper corresponding to "shut" eyes) to the object as it appears in transmitted light (the colors on the back, and now shining through, corresponding to "open eyes"). But, as has already been indicated, it is doubtful whether we ever do have visual sensations without an accompaniment of other elements derived from the present or past activity of the muscles which move the organ of vision. It is a moving eye which furnishes those peculiar changes of compound quality in its sensation-complexes that serve discriminating con-

[1] Zeitschrift f. klin. Medicin, xv., Heft 1 and 2; and Verhandlung d. Physiolog. Gesellsch., Berlin, 17 Mai, 1889.

sciousness as the *indiciæ* of motion. A further most interesting confirmation of our view comes out incidentally in performing an experiment. Holmgren found that, when we look at very faint and fine points of light with the eyes somewhat elevated, the images seem to move in the direction of muscular exertion (upward); that is, *sensations of muscular tension may express themselves as sensations of visual motion.*

§ 9. Another important fact connected with all sensations of motion must be briefly noticed. Of all sensation-complexes these call forth the most prompt and complex of purposeful movements. This fact, too, is connected with the safety and development of the life of the animal. Visual sensations of motion attract attention almost irresistibly. They "draw after" themselves the eye. If the character of these sensation-complexes is such as to threaten the eye, it promptly closes. Our extreme sensitiveness to this class of sensations is indicated by the fact that, on the lateral portions of the retina, two disks, so near as not to be seen as two, can still be seen to move on the slightest motion; and a row of dots, at a distance in lateral vision too great to have their number distinguished, may be seen to increase or diminish by a single dot.[1] Indeed, while two light-impressions of .045 sec. apart can barely be distinguished, even the *direction* of the *motion* of light can be perceived when the difference between the beginning and end of the motion is only .014 sec. A similar sensitiveness of the skin to sensations of motion, and a prompt reaction in the form of attention and of motor activity, in the way of retreat or attack, are noticeable.

Sensations of Position—those peculiar sensation-complexes which indicate the "place" on the organ where the stimulus is applied, or, in their more elaborate form, signify the relations which the different members of the body sustain to each other and to surrounding objects—are of the greatest interest and importance to the scientific study of mental development.

The fundamental fact here is, that *the compound quality of certain sensations of the eye and the skin, with their accompanying motor activities, is dependent upon local position.* To speak popularly, the skin "feels" differently, as its different areas are pressed with the same degree and kind of stimulus; the eye "feels" differently, at the different angles at which it may be placed—right or left, up or down; the limbs "feel" differently, according to the different positions which they occupy or reach, whether actively or passively. But in the interests of a more careful analysis psychology inquires (1) What, precisely, are the different factors which enter into and determine the complex character of these "feelings," or "sensations," of position; and, (2) Is the "tact" which interprets them original or acquired?

The answers which can be given to both these questions are only partial; the latter of the two can probably never be an-

[1] See an article of Exner: Ueber optische Bewegungsempfidungen. Biologisch. Centrlbl., Sept. 15, 1888.

swered otherwise than in a somewhat uncertain and theoretical way. It is not until we attempt an explanation of perception by the senses that the bearing of our description of sensation-complexes indicative of "position" can be made clear. But at this stage of the investigation two principles may guide us, as both sound and conclusively proved. First: Sensations of position, instead of being primary and independent, as compared with sensations of motion, are rather secondary and dependent. From the very first, and preceding birth even, the human animal is in ceaseless movement. No stillness, whether of the masses or of the molecules of the nervous system—nerves, end-organs, and central organs—is ever complete. No object stimulates any part of the organs of sense without breaking into a current of consciousness, whose complexion is largely determined by motor elements, or without provoking reaction in the form of changes in the existing motor elements. Without doing this, no object can even come into the "field of consciousness." *Sensations of position are dependent upon sensations of motion, in the order of the mind's normal development.*

Second: Sensations of position, like sensations of motion, involve at least that low degree of discriminating consciousness which necessarily enters into the exercise of every kind of so-called "tact." To some extent they must be considered as sensation-complexes which, on account of differences in their compound quality, are capable of becoming significant of differences that reach beyond themselves. Between them, in their lowest form, and the most intelligent and purposeful discrimination of spatial distinctions and relations, there stands a course of development. *It is a course of development*, however, *which is provided for*, not so much by the native endowment of sensations with "extensity" or "bigness" (as the writers already referred to would have us suppose), as *by the activity of discriminating consciousness itself, in accordance with the laws of intellectual life.*

§ 10. The most important thing to notice with regard to all "sensations of position," so-called, is this: we bring them into clear consciousness only by an act of attention. Such an act is certainly demanded in all experiments designed to show how accurately one can tell *whereabouts*, on the retina or on the skin, one is hit by any stimulus, or in just *what position* this or that limb has been passively placed. But the very effect of attention is to put into the sensation-complex, so to speak, a certain "motor coloring," which varies, not only according to the degree of attention, but also according to the character of the local motor organism involved. Changes in the condition of the circulation and in the underlying muscular tension of the areas stimulated are produced by the act of attention itself. It is on this

principle that the "stigmatism" of hypnotic subjects and religious devotees is produced by prolonged attention. In general, *no peripheral area can be stimulated without the resulting sensation-complex absorbing into itself the result of the motor changes brought about by attention directed to this same sensation-complex.*

Connected with this class of facts is another, which has been treated of under the title of the "dynamogenic value" of different sensations.[1] In general, a change in the relative volume of the members of the body may take place under the influence of both peripheral and central excitements. Sensations and ideas act to produce minute movements in the peripheral parts of the body; they have—to repeat the term—a "dynamogenic value;" they result in developing motor energy corresponding to their own qualities and intensities. It is not impossible that this motor value, as measured by the excitement of the movable parts of the organ, differs for different colors. One investigator, at least, arranges the colors in the order of their dynamogenic strength, as red, orange, green, yellow, blue. The same intensity of color, when seen on moving disks, has a greater strength of this sort; that is, it excites a greater concealed motor activity to blend with the visual sensations.

It is by such considerations as the foregoing that we gain some faint impression of the ceaseless and wonderfully subtle connections between sensation and motion, and of the complex way in which sensations of motion fuse with the sensations of each peculiar sense, even when the organ of sense seems to be wholly passive, receptive, and motionless.

§ 11. Experiments to determine the discriminating "sense of locality" belonging to different areas of the skin began with E. H. Weber's classical discovery. By using the two points of a pair of compasses, blunted so as to avoid the feeling of being pricked, it was found that the *minimum* distance at which they could be discriminated as two differed greatly for different areas of the body. The difference was given by the original experiments as varying from 1 mm. on the tip of the tongue, and 2 mm. on the volar side of the last phalanx of the finger, to 68 mm. on the skin of the middle of the back and of the upper arm and leg. Weber found that the fineness of the sense of locality is greater in a transverse than in a longitudinal direction on both lower and upper limbs. Moreover, if the two points are placed just far enough apart to be discriminated as two, and are then moved toward a more sensitive area, the distance between them will seem to widen; if, on the other hand, they are moved toward more insensitive parts, they will run together and no longer be distinguished as two. Subsequent experiments showed that Weber's "sensation-circles" can be much reduced by practice; and even that practice exclusively with one side of the body operates to improve the power of discrimination for the corresponding parts of the other side. It has also been shown that by carefully selecting the most sensitive pressure-spots (after having discovered where they are and "plotted" them), the diameter of the sensation-circles can be reduced to from 0.2 to 0.4 mm. for the volar side of the phalanges, and even to 4–6 mm. for the back.

The physiological explanation of Weber's "sensation-circles" is not indeed perfectly clear. We cannot, of course, assume that each circle corre-

[1] On this very interesting matter, see Féré: Sensation et Mouvement (*passim*).

sponds to a single nerve-fiber: for discrimination improves by practice, and always between any two points of the compasses, if they are farther apart than are the pressure-spots, some sensitive area can be found. The most probable explanation is, then, that the sensation-complex called out in each case depends upon the number and intensity of the qualitatively different nervous elements excited; and this is different for different areas on the various parts of the body. The psychological explanation of this experience with our skin-sensations is obvious enough; it illustrates and proves the general fact with which we are dealing. Two "positions," to which the sensation-complexes may be referred, are demanded only when the difference in the compound quality of these complexes becomes discernible. And discriminating consciousness improves within certain limits—here as everywhere—on experience. The points then appear to move apart, as the character of the sensation-complexes they excite becomes more markedly different; and when the two complexes fuse, and become indistinguishable in quality, the two points of the compasses are no longer felt as two. This is because the data for localizing them in two places have been lost.

As we have already seen, the sensation-complexes which answer to the different discernible positions of the skin are blendings of sensations of pressure of varying intensities, with temperature-sensations, and with those more distinctively motor elements to which reference has just been made.

§ 12. The nature of those sensations of position which belong to the eye is much more obscure. It is a suggestive fact that the extreme accuracy in localizing sensations of light and color which the eye can attain seems to correspond to the size of the retinal elements; conversely, the minute physical subdivisions correspond to the *minima visibilia*. Stars that are not more than 70″–30″ apart can, by the best observers, be seen as two. This agrees very closely with the calculated breadth of the thickness of the cones in the yellow-spot, where, in the retina, accuracy of localization is at a maximum. But here, as in the case of all the senses, it is *by progressive discrimination of fusing and dissolving and reforming sensation-complexes, by a process of acquired interpretation ending in consummate tact, that mental development takes place.*

Do the different elements of the retina furnish to those sensation-complexes, which the use of the eye originates, certain factors that differ, apart from varying intensities and qualities of color-tones, according to the different positions of the elements in the retina? To illustrate: I close my eyes, and, holding them as motionless as possible, I contemplate the color-mass before them. It probably varies in the color and intensity of its different smallest visible parts. But these parts differ from each other in a yet more remarkable way: they appear side by side; they lie contiguous and extended in space, as we should say. Now, does the sensation corresponding to the point a, which in color and intensity is indistinguishably like the sensation corresponding to the point x (which latter is another spot in the retinal field), differ in its compound quality from x? If we say, Yes, we have difficulty in telling wherein this difference consists; for all possible qualities and intensities of color- and light-sensations may be produced by stimulating any one of an indefinite number of spatially different groups of retinal elements. If we say, No, then we have difficulty in understanding how such extreme accuracy

and wonderful tact in local discrimination can be developed by the eye. And that it *is developed* all our knowledge of mental life goes to show.

The foregoing question is one of the most difficult in the entire psychology of sensation. The following considerations enter into even the incomplete answer which can be given to it: (1) The histological structure and the use, both of the expanded retina and of the expanded surface of the skin, suggest the similarity in development of the two senses. Sensations of position on the skin, however, seem never to result from stimulation of contiguous nervous elements without the possibility of admitting any influence from sensations of motions, either active or passively derived. We might argue, then, that the same thing is true of the eye. On the contrary (2), the different points distinguishable in the field of vision, even with the motionless eye, are presented to us with an instantaneousness, freedom from confusion with, and clearness of relation to, all contiguous points, which far outstrip the nicest power of local discrimination belonging to the skin. Finally (3), the appeal to consciousness decides the question neither way; it rather leaves it still in the balance. The fact to which writers like Professor James and Stumpf refer—namely, that all color-sensations appear before adults with "bigness" of mass belonging to them—is of no value whatever. Neither does the most refined experimental analysis enable us as yet to disentangle these alleged retinal "sensations of position."

It would appear, then, that this question cannot be decided either by a direct appeal to consciousness or by facts experimentally ascertained. It becomes, then, a question of the necessities of our theory of perception. And here, again, it would appear that the actual development which the eye so easily attains in the perception of localities in visual space requires that retinal sensations of position should be held to assist in furnishing the necessary data for discriminating consciousness. But, inasmuch as the eye is actually in almost ceaseless movement while the stimulation of its different retinal elements takes place, these sensations of movement fuse inextricably with the changing retinal sensations of position. In other words, *we localize our light- and color-sensations by means of varying mixtures of sensation derived both from the stimulation of differently located elements of the retina and from the residua of muscular and tactual sensations evoked by movement of the eyeball.*[1]

The existence and usefulness—so to speak—of "Local Signs" has now already been demonstrated. A few words more are needed, however, in order to make plain the character and the significance of this entire class of sensation-complexes. All the different senses have their own peculiar sets of local signs; that is to say, they have data belonging to their complex activity and to the part they play in the development of mental life, for contributing to our knowledge of objects, as these objects exist

[1] It need scarcely be said that this view differs *toto cœlo* from the view which, like that of Professor Le Conte, regards the mind as intuitively knowing the direction from which the light falls on the retina. The explanation of the development of visual sensations of position, by simply pointing to the physical character of the so-called "image on the retina," is not *psychological* at all. But to this subject we shall return more than once again. Comp. Le Conte: Sight, pp. 85 f. and 105.

in varying spatial proportions and spatial relations. But the sensations peculiar to some of the organs are localizable only in a secondary way. In other words, the "local signs" belonging to their activity and development are really derived from the accompanying activity and development of other classes of organs. This is true of sensations of taste, smell, and hearing. It is the accompanying customary muscular and tactual sensations which furnish to these senses their local signs. Sensations of these senses are localizable only *by means of* the activity of the skin and muscles, which are excited simultaneously with the special nerves of these senses.

It is in connection with the development of sight and touch that the nature, need, and use of local signs become evident. A study of the nature of the sensation-complexes of these senses makes it clear why we are entitled to speak of them as "signs"; they *signify* to discriminating consciousness the different positions and motions which the bodily organs and the external bodies known through them assume or undergo. They are, of course, called "local" signs, because what they signify—summed up in a single word—is the *locality* where the sensation-complexes originate, and where the object known through these sensation-complexes is to be placed. The need and use of these so-called "local signs," and how a system of them is built up (the "fields" of visual and tactual consciousness), will be further studied under the discussion of perception by the senses.

§ 13. Even the analysis which introspective consciousness can make serves in an impressive way to demonstrate the existence and nature of local signs of touch. Let any one experiment by touching, or having touched, the different small areas of his skin, and at the same time concentrate attention solely on the subjective quality of the sensations evoked. To take a special case: one brings together the two corresponding finger-tips of the two hands, and, closing the eyes to prevent distraction, considers how one feels. If the texture of the skin of the two fingers is nearly the same, one experiences a peculiar sensation-complex of light touch, resulting from the fusion of irritations arising in both fingers; and one can localize this in either finger at will. That is, there is only *one* sensation-complex; but it may serve as a "sign" for either of two localities whose existence in the general scheme of the skin is already known: these two localities, however, are the two like finger-tips. One can regard either of these two fingers as the "seat" of this sensation-complex. But if one of these finger-tips is callous and the other not, then slightly pressing them together calls into consciousness two qualitatively different sensation-complexes — one corresponding to callous finger-tips and the other corresponding to non-callous finger-tips. Now, therefore, since these two unlike sensation-complexes will not fuse, they must be localized in two different finger-tips. But only

by motion of one upon the other can we compel ourselves to decide this problem as to *which of the two* shall be "assigned" to which finger. Again, if we arouse a clear mental picture of how a particular finger-tip feels when it is lightly pressed, and then, with this same finger-tip explore a great variety of minute areas of our own body with about the same degree of pressure, we find the *two series of sensation-complexes* related in somewhat the following way: One series consists of a repetition of sensation-complexes that vary little, or none at all, during the entire tour of exploration. These all belong to the one finger-tip which "conducts" the tour and serves as the reporter of results obtained. The other series, however, varies discernibly for every one of the different "finds" located during the entire tour. Root of the finger-nail, position between it and the first joint, several positions between the first and second joints, between the second and third, various positions on the back of the hand, wrist, forearm (especially near the joints), etc., etc.—all these "localities," when visited, respond with discernibly different sensation-complexes. These discernibly different sensation-complexes *are* their respective local signs. And through the entire tour of exploration active and passive sensations of a muscular origin have been fusing with those of light pressure, and so "signifying" the rate of progress which the exploring finger makes and the place it has reached at any particular time.

That the discernibly different sensations of position do correspond to the local signs of the skin, a variation of Weber's experiment, introduced by Binet, satisfactorily demonstrates.[1] To state the conclusion, in his own words, these two things are proved: "(1) that the sensations provoked by the two points of the compasses are of different quality when the subject perceives the two points; (2) that the sensations provoked by the two points of the compasses are of the same quality when the subject perceives a single point." In fact, when the two points are far enough apart to be recognized as two, on one of them being raised, we can tell which one (the right or the left, the upper or the lower) we still feel; but if the same experiment be tried, when the two points are not discerned as two, we cannot localize the remaining point in relation to the point removed from the skin.

§ 14. The attempt definitely to describe the nature of the "local signs" of the eye is subject to much uncertainty, on account of reasons already given. But, after all, the uncertainty has reference to the amount of relative influence which the different elements have in the mixture of sensations, rather than to the existence and nature of the mixture itself, regarded as comprising the elements. There is, we may suppose, an indefinite number of series of sensation-complexes which are run through as the eye moves from A to X, or from A to Y, or from A to Z, or from A to any one of the many other possible positions of rest. The same thing is true as it moves from a position corresponding to any place lying between A and X, or Y or Z (say M or N), either toward A or toward X or Y or Z; or as it moves between any two positions (A to M or E to N, or the reverse) in the entire system of positions. Each of the sensation-complexes in these many different series is a compound quality of similar sensations of light and color, fused with

[1] La Psychologie du Raisonnement, p. 100 f.; and Art., Fusion des Sensations semblables (Rev. Philosoph., Sept., 1880).

an indefinite variety of retinal sensations and tactual and muscular sensations caused by the movements of the eye. Thus every possible direction, duration, and amount of discernible motion acquired with the development of discriminating visual consciousness has its peculiar "data" or *indicia* of "local signs."

In the development of vision, the system of local signs, thus evolved by the active movement of the eye, becomes significant of positions for the light- and color-sensations when the eye is at rest. Thus, the focusing of attention upon any minute point, or small group of points, causes to fuse, with the color- and light-sensations belonging to that point or group, the *residua*, as it were, of all the appropriate local sensations (retinal and muscular) which in the previous use of the moving eye have become "significant" of it rather than of some other point or group. The delicately varying shades of complex quality have long since dropped out of consciousness beyond all power of our recall. Much easier would it be for the child to bring up in memory the nice muscular and tactual distinctions by means of which he learned to walk, to talk, etc.; infinitely easier for the most skilful violinist to reproduce in consciousness the discriminated qualities of tactual and muscular sensations in the fingers of the "spacing hand," or in the bow-arm, by which he learned to play true notes in all the different "positions," and with every possible shade of timbre and intensity. The more wonderful and complex such *tact* is, the more completely is it lost beyond all recall.[1]

That quick instinctive synthesis and analysis which results in the "presentation" of visible surfaces, with their indefinite number of parts and points of color and light, is a development of the same tact in connection with a growth of experience through activity of allied senses. And here, once more, we must defer further consideration of the subject until we are ready to study the theory of perception.

Reference may properly be made in this connection to certain obscure, but common, and to other abnormal, phenomena. In "orienting" our limbs and our entire bodies in space, we are, undoubtedly, guided by complex forms of sense-experience due to the fusion or mixture of visual, tactual, and muscular sensations, in a way already described. Thus we customarily know where *we* are, and where the different parts of our bodies are, and where *things* are, with reference to us and to each other. But if any of the well-recognized sensuous data are disturbed or removed, we are wholly at a loss in our localization or we make unusual mistakes.

But other important "sensations of position," whose origin and nature remain obscure, undoubtedly blend with all our sense-experience. Lesions existing in certain organs of the brain, or

[1] This and all the modern views concerning local signs of the eye are modifications of the view proposed by Lotze, in its earlier form, in Medicin. Psychologie, ii., chap. iv. Wagner's Handwörterb. d. Physiol., III., i. And, in its later form, Metaphysik, iii., Abth. 1. To these may be added a communication to Stumpf, and an article on La Théorie des Signes Locaux, reprinted from the Rev. Philosoph., Oct., 1877—both found in Kleine Schriften, iii., Leipzig, 1891. See also Ziehen: Introduction to Physiological Psychology, p. 190 f.

strong excitement sent through them by electrical currents (notably the cerebellum), result in an extensive or complete "upsetting" of our calculations in localization. In general, the position of the head has great influence in the orienting of all the rest of the body; but sensations of position, serving to orient the head itself, do not appear wholly to arise in the skin and muscles of its superficial portions. Recent experiments show reasons to assign a greater or less degree of influence to sensation-complexes originating in the condition of the semi-circular canals of the inner ear and in the movement and pressure of the fluids contained within this organ. In many of the central parts of the organism the changes in the pressure of one part upon another, and of the internal fluids upon the different contiguous parts, doubtless give rise to sensation-complexes which become "significant of" their *position*.

§ 15. It has been said—and, probably, truly—that a recent investigator[1] has put forever to rest all doubt as to the influence of the semi-circular canals upon our sense of position and of direction. This observer succeeded in exciting the three canals separately without injury to the brain of the animal, and in getting motor reactions, dependent as respects direction, upon the particular canal excited and upon the direction of the current. The result scarcely compels us to hold that the semi-circular canals are the special end-organs of the sense of position; but it indicates strongly that sensations arising from their irritation blend with others in helping us to orient the head and the body. The cerebellum, or little brain, is declared by this same investigator to be the central organ for sensations of position with which the canals, as end-organs, are immediately connected. Here, again, the conclusion is perhaps extreme; but numerous phenomena which have been familiar to physiological psychology for a long time show plainly that the action of this part of the brain is especially connected with that entire sensory motor apparatus by means of which the animal keeps adjusted to its environment through sense-experience.

Another investigator[2]—after distinguishing between "static" and "dynamic" sensations, and assigning many of our static sensations of position to the eye-muscles—affirms that, apart from muscular and cutaneous sensations, we sense the positions of our bodies in dependence upon the gravitation of internal fluids and organs. The same writer also holds that the "dynamical" sensations by which we orient ourselves—when, for example, our bodies rotate—are due to variations of endolymph pressure in the ears, as the head turns around upon its various axes.

We are so accustomed to regard only the normal forms of the fusion of our sensation-complexes, that it seems to us as though *these* forms, and no others, indicate the essential nature of things.

[1] J. Breuer, in Pflüger's Archiv, xliv., p. 135 f. (1888). And see the Am. Journal of Psychology, Feb., 1889.

[2] M. Delage: Archives de Zoologie expériment., No. 4, 1886, pp. 535–624.

But a profounder examination of the conditions of sense-experience shows us that this "common-sense" conclusion is untenable. To see with the ears, or taste with the tips of the fingers, instead of the tip of the tongue, appears at first not only practically impossible, but intrinsically absurd. In truth, however, the whole question is one of actual arrangement of different locally separable end-organs and brain-centers, on the one hand (the physiological side); and, on the other hand (the psychical side), a question as to what kind of simple sensations actually fuse into sensation-complexes, and these into more complex forms of sense-experience, as the development of experience goes on. What sensations actually fuse with what others, and what kinds of sensation-complexes thus arise, is a matter determined for the student of psychology wholly by the concrete conditions of experience. As these conditions change, the results are altered; and thus new and even antecedently inconceivable *sensuous data* may arise. What remains relatively unchangeable is only *the laws* that control the development *of intellectual life.*

Such statements as the foregoing are not based exclusively upon theoretical grounds. They are suggested by the influence which sensation-complexes of one class have upon sensation-complexes of another class, even in those cases where the "influence" comes far short of a "fusion," properly so-called. But they are also actually illustrated by certain rare cases where abnormal connections have been established between the ordinarily distinct kinds of sensation-complexes. If these connections become constant and fundamental, we have a result resembling that of the "fusion" of pressure and temperature and muscular sensations (active and passive) into what we call sensations of touch; but if the connections are less constant and fundamental we have any one of several forms of so-called "association" between sensations of one class and sensations, or images of sensations, belonging to a different class.

§ 16. The question, If one organ of sense be stimulated with a small degree of stimulus, will the simultaneous stimulation of another organ of sense influence the first? has been attempted in an experimental way. The affirmative answer to this question, as given by one investigator,[1] among others, shows that interesting relations of influence may exist between the different classes of sensation-complexes. In general, the second stimulation may "lower the threshold" for the first. For example, the sounding of a tuning-fork causes colors, before scarcely visible in the distance, to appear more clearly. The influence of sounds on faint smells, tastes, and touches may be similar. Conversely, a very faint sound may lose some of its inten-

[1] Urbantschitsch, in Pflüger's Archiv, xliii., 3 and 4 (1888).

sity when heard with closed eyes. The influence of sight on smell is said to be very slight, but considerable on taste. Smell may slightly reënforce the other senses; but its influence is more marked with sounds, while taste has most influence over colors. Illumination increases sensations of temperature; but stimulation by heat or cold of one area of the skin may diminish the tactile sensibility of another area, while tactile stimulation may affect favorably temperature-sensations.

Whatever modifications may be found necessary in the detailed results of such experiments, *the general fact of the influence of sensation-complexes of one sense over those of another is undoubted.* This fact indicates that the connections between the brain-centers and processes which correspond to the different senses are not of the nature of fixed and unalterable intellectual relations. And on the psychical side it is the mere fact of constant or varying concurrence in consciousness—of separateness, or of more or less perfect fusion—which determines the compound quality of all our sensuous data.

§ 17. An instance of abnormal "fusion" or "association" takes place in those not very rare cases of persons that have "color-audition," so-called. In the most marked of these cases the hearing of a particular sound uniformly and spontaneously provokes the seeing of a particular color, which varies with the sound heard. This fusion of sensations may become so complete as to lead the subject in one and the same mental act both to hear and to see the particular vowels when they are pronounced. Thus, in the case of one French family (father, son, and daughter), the vowels *a*, *à*, and *á* provoked different shades of yellowish red (*brique, nuancé de jaune, saumoné*); *e*, *è*, and *é*, different shades of white (*claire, pur, citronné*), etc.[1] Joachim Raff, the musical composer, declared that he saw the sound of the flute, azure blue; of the hautboy, yellow; of the cornet, green, etc. Less complete fusion, or what we are accustomed to call more or less separable "association," characterizes the experiences of others. In this way different words, or languages, or shapes, come to have a color value. In some rare cases—even the slightest change in the shading of the sound of the letter is seen also as a change in its color-tone.

In still other cases, vowels or words, when seen, have particular color-tones always attached inextricably to them. Nor have subjects been wanting who were ready to declare that, to them, the odor of vanilla is light lilac, the odor of vinegar is red, and so on. It is to the same physiological and psychical principles as those which are illustrated in all fusion of sensation-complexes, and in the formation of local signs, that we are to look for the explanation of such abnormal phenomena. It is also by an extension of the same principles that, in part at least, the wonderful phenomena of clairvoyance, telepathic sensation, illusions, and hallucinations by suggestion, etc., are probably destined to be explained. Here, again, we may declare: *It is not the quality, intensity, and characteristic form of fusion, which belong to the sensuous data, that are unchangeably fixed either by the physiological or by the psychological laws of our complex development.*

[1] See Laurel and Duchaussoy, in Bulletins de Phys. Psych., No. 8, p. 11 f. And on the entire subject, a monograph by Dr. W. O. Krohn: Pseudo-Chromesthesia (reprinted from Am. Journal of Psychology, Oct., 1892), and the bibliography at the end.

Finally, our description of the elements of sense-experience has already led us some distance beyond itself. "Discriminating consciousness," which is the very essence of primary intellection, has been everywhere assumed. And, in a less obvious fashion, the existence of at least a low form of memory has been taken for granted; while the feeling aspect and the conative aspect of even our so-called simplest forms of sense-experience has never for a moment been lost wholly out of sight. But we must now turn backward, as it were, and review the path of development in the consideration of these other than the sensation-elements of our mental life.

CHAPTER IX.

FEELING: ITS NATURE AND CLASSES

THE phenomena observed by attending to that aspect of consciousness which is known by the name of "Feeling" have baffled the student of psychology from the beginning of investigation to the present time. The reasons for this fact are, chiefly, the following three: First, the amount of analysis devoted to this aspect of mental life has been too small, whether we regard its relation to the intrinsic difficulty of the subject or to the amount of study bestowed upon other aspects. Then, too, the connection of affective phenomena with hotly debated questions in ethics, æsthetics, and religion may have contributed to increase the influence of prejudice in the study of these phenomena. But, second, the nature of language and of the relation it sustains to the description and explanation of psychoses is such as relatively to hinder the growth of a science of the human feelings. Language is framed, primarily, to convey an accurate knowledge of those objects in whose existence and relation to man his most fundamental as well as most highly intellectual needs make him interested. But language describes and explains the feelings of man only in a secondary, inaccurate, and always figurative way.

But the third and chief reason for the unsatisfactory state of the psychology of feeling is the very nature, conditions, and laws of the phenomena of feeling itself. As to its nature, feeling is relatively indescribable. It may, indeed, be excited or communicated by language, or other conventional and interpretable signs. But in every case it is, of course, the ideas which are primarily communicated; and whether the corresponding feelings are excited depends not only upon the communication of ideas, but also upon a variety of secondary considerations connected with the entire affective character of the mental life. Even the failure of language, to which reference was just made, is therefore largely due to the intrinsic difficulty of the subject-matter to be expressed. Moreover, the ideation and memory of one's own states of feeling is extremely uncertain and fluctuat-

ing; while all know how vain it is to expect one man to imagine precisely how another man feels. Experimental methods vary largely, or even completely fail us here. We cannot readily contrive a mechanism which shall serve to measure the relative magnitudes of the higher and more complex feelings, or to analyze them into their simpler component parts. In their own true nature also our feelings *are* so very evanescent, subtile, changeable, and intricate, that whereas we can, by attention, tell with some commendable approach to accuracy what we see, hear, imagine, or think, we find ourselves puzzled precisely to set forth both what we feel, and why we feel as we do feel. Nay, when we attend to what we feel, the very act of attention, instead of clearing up and intensifying the "content" of the feeling, as it were, takes from it all its rich warm color *as feeling*; or else even banishes it quite from the stream of our consciousness.

Not only the nature, but also the conditions and laws of the phenomena of consciousness in its aspect of feeling are relatively obscure. The physiological conditions of some of the stronger forms of emotional consciousness are indeed sufficiently evident. But, in general, the caution with which men deal with each other's feelings and the admittedly large incalculable element which belongs to all attempts to realize the right conditions of any particular form of feeling (especially those of the subtiler and finer sort) show how profound is our ignorance of all that can reasonably be called "law" in this realm. "To minister to a mind diseased" requires more than ordinary biological or medical knowledge.

§ 1. The history of the psychology of feeling is very instructive on the foregoing points.[1] The bipartite division of the mental faculties into cognition and will, which prevailed from Aristotle down to comparatively recent times, operated to obscure the distinctive character of the affective elements of mental life and to prevent their receiving due scientific attention. Plato's classification of the feelings, on the principle of their relative dignity and relation to a bodily basis, probably operated in the same direction. The Cartesian philosophy, which regarded "thought" as the essential characteristic of mind, as extension is of matter, kept attention fixed upon the mechanism of ideation; and the English "associational" and French "sensational" schools absorbed, for these sides ("idea" and "sensation") of many-sided human life, the interests of all investigators. Modern psychology owes in large measure to Rousseau, the analyst of the heart, with his keen, but morbid interest in his own emotions and sentiments, and to the sentimental movement in literature which followed him, the awakening of

[1] Brief notices in this line are found in Steinitzer's Die menschlichen und thierischen Gemüthsbewegungen. München, 1868. And Jungmann: Das Gemüth. Freiburg, 1865.

scientific investigation in this sphere. Kant's espousal[1] of the tripartite division of so-called mental faculty, and the persistence of this division in spite of all attempts by the Herbartian psychology and the philosophy of Schopenhauer to overthrow it, have had a powerful influence on prevalent opinion. But especially is it the effect of biological study, and of the increasing influence of the theory of evolution, which has caused due emphasis to be put upon the scientific investigation of affective phenomena. For these, of all mental phenomena, are not only the most obscure and provoking in character, but they are also most permanent and universal. In the possession of certain fundamental appetites, passions, emotions, and sentiments, men differ far less than in the possession of "ideas" and "thoughts." In respect of the higher realms of æsthetical, intellectual, and religious feeling, the conviction of modern psychological science affirms that an understanding of the lower, more obscure, more purely sensuous, and yet instinctive and fundamental forms of feeling is essential to any satisfactory comprehension. It is indeed the one touch of feeling-consciousness which "makes the whole world kin."

The result of this awakening and spreading interest in the study of human feeling, scientifically, has been felt in several ways. Among these the multiplication of special treatises on this branch of psychology, and the enlarged space allotted to it in works which aim to cover the entire ground of mental phenomena, are noteworthy. But the multiplication of artistic and literary products—for example, the Wagnerian music and the modern novel—which are based upon and aim to set forth conclusions in the psychology of feeling is scarcely less noteworthy. With all this hopeful endeavor it will never be possible, however, to reduce to a strictly scientific form the life of sentiment and emotion. It is necessary, in the interests of science, to acknowledge this at the outset, and with the utmost candor. We positively must refrain from "completing" our science by impoverishing and belittling the subject of its investigation.

The real and essential Nature of Feeling, as such, cannot be defined; it cannot even be described in terms that have a meaning corresponding to the psychical state for which they stand without being converted back, as it were, into feeling again. This impossibility of definition, strictly speaking, follows from the very fact that the aspect of feeling is primary, fundamental, irreducible to lower terms, in the mental life. To attempt definition is, therefore, to try to answer some such question as this: In what common characteristic do all the different feelings perfectly agree: in what respect are even pleasures and pains alike? To such a question no other answer is conceivable than this: All feelings, high and low, and even pleasures and pains, are alike in this, that they *are* forms of *feeling*, and *are not* ideas, thoughts, volitions, etc. But there is another reason why

[1] This is true, although Tetens, in his Philosoph. Versuche über die menschliche Natur (Leipzig, 1777), had appeared as the defender of the "faculty of feeling" as an independent power of mind.

feeling cannot even—to speak accurately—be adequately described. Description is in language, but language itself is the expression of conceptions and thoughts. And the conception of any feeling differs *toto cœlo* from the feeling itself. Indeed, the last result of the analysis on which modern psychology relies, and which we have already intelligently adopted, affirms that all psychic facts, and all the psychic life built up by the facts, reveals three irreducible aspects, of which feeling is one.

It is not so much, then, the business of psychological science to tell just what feeling is, as to investigate the conditions under which the various forms of feeling arise in consciousness and to discover their common characteristics, their relations to other forms of mental life, and the evolution of the more complex feelings from the simpler, etc. For to feel is as simple, fundamental, and universal an aspect of all psychic facts, or—if one wishes to use the expression—function or faculty of man, as is discrimination, or sensation, or volition. And feeling cannot have its nature, which is *sui generis* (the "genus" not being of the same family as knowledge), stated in terms of knowledge: *the very life and essence of feeling is in being felt.*

It is customary for psychologists to express the foregoing truth by asserting that, whereas sensation has a presentative element, and knowledge is objective, feeling is always purely "subjective." Thus the term feeling, or sensibility, is said by one writer[1] to "denote the subjective aspect of consciousness anywhere and everywhere." Another author,[2] speaking in a more carefully qualified way, declares: "Feeling is subjective experience *par excellence*." But the question at once arises: Is it not just this *subjective* aspect with which all psychology deals? All its phenomena are regarded as subjective; that is to say, they are regarded as phenomena of consciousness, as such. My sensations are no less *of me* as their subject ("mine own") than are my feelings; and this I quickly discover when I try to communicate about colors with one color-blind, or about tones with one tone-deaf. And what can be for me more truly "subjective" than my castles-in-the-air (when I imagine myself rich and powerful), or those choices for which conscience commends or reproaches me? Such a characterization of the peculiarity of feeling is, therefore, not clear and universal: it contains, however, a valuable truth; for it serves in a way to mark the difference between feeling and sensation, where, as happens in almost all our conscious life, the two are blended to-

[1] Baldwin: Handbook of Psychology, Feeling and Will, p. 135.
[2] Sully: The Human Mind, II., p. 2.

gether in the unity of consciousness. My sensations are, indeed, mine as truly as my feelings are; both are alike subjective. But my sensations are what my feelings are not, and cannot be conceived as being; they also, in the development of perception, become referred, as qualities, to the objects known in sense-experience. Things are green, blue, sweet, sour, hard, soft, warm, cold, etc.; and, in respect to the "objective" character of some of their qualities, even the most interior parts of my body are things to me. But when I say my finger aches, as well as when I say that the music makes me sad, the ache and the sadness have no "objective" existence; they are, indeed, mine *par excellence*, as contrasted with all qualities of things which occasion them. Thus we say, by a fiction which all the development of our sense-experience fosters and almost necessitates: the objects with their qualities would be there, as we perceive them, if neither we nor any one else really did perceive them; but how absurd to suppose that the pain or the sadness would be anywhere when our "subjective experience" passed away.

Two theories, which regard the "nature of feeling" as secondary and derivative, have flourished, especially in modern times. One of these is physiological, the other ideational. The physiological theory, when extreme, describes feeling as the consciousness of certain nervous processes, or relations between nervous processes—a becoming-aware of the condition of the nervous system under the action of varying quantities of stimuli. The ideational theory regards feeling as the consciousness of relations subsisting between the ideas—a becoming-aware of the mutual "hindrance" or "furtherance" which the different ideational factors undergo as they rise together above, or work upon each other below, the "threshold of consciousness." Now, in so far especially as feelings are pleasurable or painful, the condition of the nervous system and its relation to the intensities of stimuli which act upon it are, doubtless, of great importance in determining the character of the feelings. So all the character and relations of the different factors and objects in the stream of conscious ideation and thought influence profoundly our emotions and sentiments. But we are not conscious of the functioning of the nervous system; and if we were, this consciousness would not be *feeling:* it would only be at best our knowledge of *how the nervous system is behaving* when *we* are feeling. The physiological theory, therefore, confounds certain possible conditions of feeling with the nature of feeling itself. And the "ideational" theory commits the same mistake in another way.

One other mistaken view of the nature of feeling is yet more widely current in modern psychology. In its fuller form of development this view may be stated as follows: All feeling *is*, essentially considered, pleasure or pain, in the most extended meaning of these words. Or—to manufacture a convenient compound term—"pleasure-pains" are exhaustive of the entire quality of the feeling-aspect of consciousness; all feelings, as feelings, are nothing but "pleasure-pains." Now—this theory goes on to argue—different pleasures or pains differ only as respects intensity or amount; therefore they are measurable by a common standard, and, like sensations of the same sense, may be called upon to take their allotted place in a "pleasure-pain" series, a scale properly graded as to intensity. But since feeling is essentially either pleasure or pain, the different so-called "kinds of feeling" have, as feeling, no qualitative difference; all that which seems to us as difference is but due to association with qualitatively different sensations or ideas. Feelings, as being essentially "pleasure-pains," differ only in the amounts of the pleasure or pain which they are; they cannot, therefore, be distinguished as "kinds" or as having lower and higher degrees of "value" according to an ideal: feelings, as such, can only take their allotted place in a scale graded according to intensity.

It would be impossible at this point to indicate the far-reaching (and, as we believe, misleading) effects of this view of the nature of feeling. The different subordinate considerations involved will be discussed in their proper places. But let us here enter against it a most decided protest, not only as wholly inadequate to describe and explain the admitted data of consciousness, but even as contradictory of those data. To us this theory seems "simplicity" itself: but simplicity, in the interests chiefly of biological and experimental psychology, "gone entirely mad."

§ 2. As expressing the correct view of the nature of feeling, we may quote again from Dr. Ward, the declaration:[1] "Feeling as such is, so to put it, matter of *being*, rather than of direct knowledge." The peculiarly *subjective* nature of feeling, in the meaning of the word "subjective," already explained, may be emphasized in various ways. In our common talk about sense-experience we divide it all into two easily and vividly distinguishable parts. One of these has reference to how "things behave," what qualities they have, or how they "appear to us." But the other has reference to how "we feel" on occasion of our sensing things, or having them appear to us. Hence those sensations which are wont to be had with an accompaniment of markedly pleasurable or painful tones of feeling are themselves called "feelings." Thus we are said to "feel" the cold or heat, whether of our own bodies

[1] Art. Psychology—Encyc. Brit., p. 67. Comp. also Hamilton: Lectures on Metaphysics, p. 559 f.

or of the objects in contact with them. We "feel" the intra-organic pressures and movements as well as the pains which we obscurely localize in these organs. All bodily pains and pleasures, as well as the æsthetical and ethical sentiments, are also said to be "felt." Especially do we popularly classify those mixed and massive, or more shadowy psychical states, which depend upon a large number of obscure and ill-localized organic conditions, among our "feelings," rather than among our sensations. We "feel" well ("pretty well" or "first-rate"), or indisposed, or ill; we feel elated or depressed in a physical way, "queer," "not like ourselves," etc.

In such uses of the term "feeling" as the foregoing, it is to be noted that ordinarily we refer to psychical states in which tactual, muscular, and temperature sensations are largely predominant. Sensations of smell and taste, which are confessedly most subjective, as well as sensations of sight, which are undoubtedly most objective, are rarely or never spoken of as "feelings." In the case of predominatingly muscular sensations, we talk of ourselves as "feeling" sore or weary. Now, since feeling is preëminently subjective, the question arises why we do not identify it with the most subjective of all our sensations—with smell, for example. The answer to the question lies in the fact already stated—namely, that, while we never for an instant think of really confusing our feelings as subjective with sensations as objective, some of our sensations are in experience inextricably bound up with feelings that have a strong and persistent tone of pleasure or pain. Many smells and tastes are indeed very disagreeable; but ordinarily we can quickly separate these sensations from the complex of our bodily organism. We can blow from our nostrils or walk away from the disagreeable smell; we can spit out the bad-tasting substance and have done with it. In the case of sight, there is little or no temptation to confusion of language. But our bodily sensations of the organic, tactual, muscular, and temperature order, with their strong accompaniment of painful or pleasurable feelings, we cannot dispose of so easily. We cannot eject them or get away from them. They are therefore *our feelings* preëminently. Yet this fact does not vitiate the distinction, which is even much more persistent and which lies at the base of all our mental development, between the feelings as subjective and the sensations as having objective reference and signification.

Such psychological truths put forever to rest all attempts to identify the feelings with the sensations. It has been argued[1] that, because there are specific nerves whose excitement occasions pain and also specific nerve-tracts and brain-centers concerned in the transmission of the resulting nerve-commotions, therefore pain is as truly a sensation as the sensation of temperature or even of the color blue. But if we admit this very doubtful physiological statement, the admission really has not the slightest bearing on the psychological distinction. To prove the biologist's claims here, and then adopt his language, would only result in another distortion of the primary data of psychology. It would be another misuse of biology—a science which, improperly employed, is as foreign to the classification of mental phenomena as is the science of astronomy. What human conscious-

[1] See on this point two interesting articles by Dr. H. Nichols, in the Philosophical Review, July and Sept., 1892, and the reply of Mr. Marshall, ibid., Nov., 1892.

ness has "put asunder," as it has sensations and feelings, cannot again be "joined together" by biology.

§ 3. Valuable considerations concerning the bodily and mental conditions of the different classes of feelings are afforded by both the physiological and the ideational theories of feeling. For this reason both theories have contributed much to the psychology of this difficult class of phenomena. But both err in their exclusiveness; they err also in a fundamental way, when they regard feeling as a derived or secondary form of mental life. In opposition to this latter error, it has been maintained that, on the contrary, feeling alone is primordial in all consciousness. Thus we find writers, in almost all respects so far opposed as are Mr. Spencer and Professor James, agreeing in the use of the word "feelings" for all classes of elementary psychic facts. But inasmuch as all psychic facts, even the most elementary, cannot become data of consciousness—much less data of self-knowledge—without attention and discriminating consciousness, Dr. Ward correctly maintains: "The simplest form of psychical life involves not only a subject feeling, but a subject having qualitatively distinguishable presentations which are the occasion of its feeling." (As to how we should modify and interpret this statement it is not necessary here to add anything to what has already been said.)

The Herbartian theory of feeling has so much which, in spite of its fundamental errors, is interesting and helpful in explanation, that it deserves brief mention here. This theory holds that feelings are not primitive states of mind. Painful and pleasurable bodily states are not to be regarded as feelings at all: they are rather sensations. All true feelings depend upon the character of the ideating activity; in nature they are just this: *the consciousness of* the reciprocal action of the ideas. Or—to follow the explanation given by the most finished writer of this school in his masterly treatise on psychology[1] "Feeling is to be considered as the consciousness of the process of ideation itself, as distinguished from consciousness of this or that particular idea;" and it is conditioned upon some resistance being offered to this process. It must at once be admitted that the character of our intellectual, æsthetical, and ethical feelings is determined, by the relation they sustain to the different intellectual processes, both the more fundamental and the more complex. (Here again we may leave the errors of the Herbartian theory to the correction afforded by a study of each particular position involved in the theory.)

§ 4. The view which asserts, not only that all feeling is either pleasurable or painful, but that "pleasure-pain" is all there is—so to speak—of feeling, receives confutation at every point from the data of psychological science. It follows from this theory—among other conclusions—that feelings, as feelings, have no ideal value; they are only mere *quanta* of pleasure or pain; they cannot be placed in a scale of ideal values, as noble or base; they can only be placed in the scale of "pleasure-pains," as greater or less. But these are subjects the discussion of which belongs later on. It will suffice at

[1] Volkmann von Volkmar: Lehrbuch d. Psychologie, II., p. 298 f. See also Nahlowsky: Das Gefühlsleben (3d ed.). Leipzig, 1884. Beneke: Lehrbuch d. Psychologie als Naturwissenschaft, p. 170 f. Drbal: Lehrbuch d. empirisch. Psychologie, p. 200 f. On the other hand, that feeling is primordial—Horwicz: Psycholog. Analysen, I., p. 168. Comp. Lotze: Medicin. Psychologie, p. 235 f.

this point briefly to point out how this surprising "fallacy of the psychologist" contradicts the plainest dicta of everybody's consciousness.

(1.) It has already been shown that even the most primary forms of feeling cannot become data of knowledge without being attended to with the exercise of discriminating consciousness. *But neither, when thus attended to, could they be discriminated as different, unless they were, as forms of feeling-consciousness, really different.* We cannot, of course, "classify" the feelings without regarding them as objects of knowledge; and we must classify on a basis of the relations they sustain to knowing activity: for this is what *classification* is—namely, discriminated and "sorted out" objects of knowledge. But neither could we classify *them* at all—even thus indirectly, and by reference to the occasions on which they occur, or to the sensations and thoughts they accompany—unless they showed actual qualitative differences, that is, were classifiable as *really being* like or unlike.

(2.) It is plain that, upon a matter of this kind, an appeal to consciousness is decisive; and it alone is decisive. For—as has already been said—the very nature of the feeling itself is in the state of the being of the subject whose the feeling is; its whole nature is in its being felt. And here no objective reference to aught beyond the feeling, whether to nervous processes or to processes of ideation considered as occasions of the feeling, has anything to do with the nature of the feeling, as such. To ask one, How do you feel? is not the same thing as to ask one, What are your ideas? or, What is the condition of your nervous system? In answering the first question, one may indeed tell one's ideas, in order to describe one's feelings; or one may make reference to more or less obscurely localized bodily sensations, using the customary terms in the description of them. Still, only the subject's immediate awareness of his own state of being can answer the question, How do YOU FEEL? Now, nothing can possibly be more confusing to this supreme arbiter of such a question than to be brought face to face with the "fallacy of the psychologist." That, for example, my feeling of *surprise* (whether occasioned by a sudden blow on the face, or by the receipt of unexpected news, or by the rise in consciousness of one of those "truths that wake to perish never") does not differ, except as to the amount of pain or pleasure it occasions, from my feeling of *expectation* (when I am looking forward to a sea-voyage or to meeting a friend), or from my feeling of *doubt* (when I am considering which candidate to vote for or which side of an opinion in philosophy to espouse), or from my feeling of *conviction* or *belief* (as it enters into all that knowledge of objects I call "real"), or from my *ethical* and *æsthetical* feeling (when I contemplate a mean act, or look upon a good picture, or hear the *Andante* in Schubert's posthumous quartet)—all this is simply intolerable to self-consciousness.

(3.) The theory which identifies feeling with "pleasure-pain" throughout is also self-contradictory. That pleasure and pain are distinctly different kinds of affective consciousness no one can doubt. Philosophers and psychologists have indeed thought (mistakenly enough) to simplify matters by speaking of one of these forms of feeling as "positive" and the other as "negative." It is, of course, possible—theoretically with great exactness, and actually in a somewhat rough way—to shade the different quantities of bodily pleasures and pains from the very highest to the very lowest degrees

of both. Thus we can enact the fiction of a "zero-point," or "point of indifference," a place in the scale where the pleasure passes over into pain, or the reverse. But by this fiction neither pleasure nor pain loses its distinctive quality. We may, indeed, be unable to say whether a particular feeling is disagreeable or agreeable; either form of feeling may be so slight as to be not easily discernible by even the most attentive discriminating consciousness. But a slight degree of pleasure is no more *like* a slight degree of pain than is a greater degree of one like a greater degree of the other. What our language means is, that both pleasures and pains are recognized as differing in intensity. But something besides mere difference in intensity is implied in our bringing so distinctly *unlike* psychic states, as are those of pleasure and those of pain, together into one class, and then calling them both by the common term "feeling." It is implied, of course, that pleasure and pain are certain "kinds" of feeling. In other words, in spite of their opposition, they are classed together as distinctly different sorts of one fundamental form of psychic life. This fundamental form is no other than what we mean by the word "feeling." The whole nature of feeling, then, cannot be described as "pleasure-pain." What we really mean is: feelings are either pleasurable, or painful, or possibly "neutral." To make our meaning run thus: feelings are naught but "pleasure-pains," when pleasure *and* pain are recognized as opposites in kind, is to reason that two distinctly unlike psychic facts may be thrown into one category (and that a most important and fundamental one) without their being in any distinctive respects alike. This is self-contradictory.

(4.) Moreover, the theory which identifies feeling with "pleasure-pain" renders absurd some of the very problems on which it claims to throw light. For example, the question whether there are "neutral" feelings (or feelings that are neither pleasurable nor painful) thus becomes unmeaning. This theory attempts to settle the inquiry as to the existence of neutral feelings in a haughty *a priori* fashion, although it claims to speak in the name of so-called inductive psychology. According to this theory there *are* no such feelings, because there *cannot* be: since feeling *is* "pleasure-pain," and nothing else. But the inquiry as to the existence of neutral feelings is plainly an inquiry as to matter of fact. It can be settled only by an appeal to the consciousness of the subject whose *being* the feeling is. And there is absolutely nothing which we know about the nature of feeling, or about the conditions under which the tone of feeling is generally determined as either pleasurable or painful, which renders it impossible that different individuals may differ here. Indeed, one class of feelings, or one degree of any class, may be "neutral" in the case of some individuals, and not in the case of other individuals; and feelings that have had one tone of feeling, may, under the law of habit, etc., lose this tone and become neutral in the case of any individual.

The Conditions of all Feeling, as such, and the conditions of the different phenomena of feeling are, like the nature of feeling, peculiarly difficult of determination. The conditions under which the tone of bodily feeling is either pleasurable or painful, and the conditions under which the pain or pleasure increases in in-

tensity, may indeed be experimentally investigated. But the more complex, higher, and nobler feelings—even as respects their varying degrees of pains and pleasures—cannot be subjected to the researches of the psycho-physical laboratory. Our only means for investigating them involves interpreting the *insignia* of feeling as they abound in conduct, literature, art, and in the broad fields of historical and ethnological investigation. But the physiological and psychical conditions under which these feelings arise and develop in consciousness are even more hidden than is the real nature of the feelings themselves. Even in one's own case, one can neither measure, for example, the "pangs of unrequited love," nor the rapture of religious ecstasy, nor the sorrows of remembering the "silent dead." Both the mental preconditions and the bodily mood which determine such forms of feeling are obscure. Weber's law—bad as its failure is esteemed by some to be even in the realm of sensations—has even less application to the higher forms of feeling.

General biological considerations, and more particular considerations taken from human physiology, enable us to make certain probable conjectures regarding the common physiological conditions of all feeling, as such. But here a most notable and interesting fact meets us at the threshold of our investigations. Neural processes, consummated in the central organs, are (so far as we know) the one physiological precondition of all states of human consciousness. These processes are immensely complex, and involve countless elements, acting and reacting, as an accompaniment to all our flowing stream of mental life, in manifold forms of chemical, thermic, and other molecular changes. But complex as these processes are, and complicated as are the modes of energy they involve, since they are all "physical changes," they must be supposed to be statable in terms of the amount, time-rate, and direction of motion. That is to say: ultimately considered, in the light of physical analysis, all the neural processes underlying the different psychic facts are of *one* kind. But we have seen that, ultimately considered, in the light of introspective analysis, all the resulting psychic facts have *three* aspects: they are facts of intellection and conation not only, but also facts of feeling. If we may be pardoned the apparently metaphysical figure of speech: the psychical being we call mind responds to neural changes, which are essentially of one kind, with a manifestation of its own life, which is essentially threefold in aspect. Or *discriminating consciousness analyzes in a triune way what psycho-physics regards as conditioned upon the occurrence of a physical change essentially the*

same. Yet the unity that this threefold aspect of consciousness presents is the highest of all unities; it is the unity in variety of consciousness itself. However we may choose to express this fact, we cannot explain it; we can only acknowledge it as an ultimate fact.

None the less, however, do we have good grounds for believing that changes in the amounts, kinds, and tone (as pleasure or pain) of the feelings are dependent upon changes in the neural processes. And what are the most general Physiological Conditions of the differences of the Feelings, in these respects, we can conjecture with some show of reason. Different individuals differ more widely and more incalculably as to the particular feelings evoked, on different particular occasions, than as to the sensations and ideas occasioned by changes in the amounts, kinds, and time-rates of the stimuli which act upon the nervous system. This fact suggests that our feelings are determined by the changeable relations of the neural processes to the constitution, previous habits, and temporary mood, of the nervous system, and by the relations of each neural process to all the others within the central system, in a more irregular way than are our sensations and our knowledge. Those conditions of the nervous processes which depend immediately upon the nature of the stimuli that act upon the end-organs are in general conformable to law; they are regular and—as it were—to be depended upon. In correspondence with them is the regularity and dependableness of our sensations and of our knowledge by the senses. But over and above the more uniformly recurrent similar elements in all the peripherally originated nervous processes, there is more or less of a semi-chaotic surplus of nervous action occasioned in the brain-centers. In this "semi-chaotic surplus"—the general character of which depends upon what the whole nervous system was, and is, and has recently been doing, and upon how the various new stimulations, running in to the brain-centers, fit in with all this and with one another—may we find the physiological conditions of the feeling-aspect of consciousness. No wonder, then, that these conditions are so obscure, so indeterminate for different individuals, so changeable in the same individual. *At any particular moment the kind and amount of feeling experienced has for its physiological condition the total complex relation in which all the subordinate neural processes, set up by the stimuli of that moment, stand to one another and to the set, or direction, of pre-existing related neural processes.* To this truth our language bears witness when we speak of "mood," "disposition," "feeling as though," "feeling like," etc.; as well

as when we consider how large a number, even of our most primary forms of feeling, are really "feelings of relation" (what one feels "depends" on how one takes it, how one looks at it, etc.). Indeed, it is the changes of our psychic combinations, the movements on the board, which we chiefly feel.

Many of the most important common Psychical Conditions of all Feeling are indicated by certain words already employed to designate its physiological conditions. Among such words, most frequent and suggestive, are "disposition," "temper," "mood," mental "attitude," and the like. What is meant by these words is, in the main, precisely this: a permanent and constitutional, or a temporary and relatively accidental tendency to react upon all forms of stimuli with certain characteristic forms of feeling. Thus, we call one man "haughty" and another "reasonable" in disposition, "violent" or "quiet" in temper; and we say of ourselves: To-day I have felt as "happy as a lark," or "as cross as a bear." We expect that the affective phenomena, the emotional tone of consciousness, will correspond to disposition or mood, whatever be the particular sensations, perceptions, or thoughts which furnish the occasions and accompaniments. Everything looks "yellow" to the man of jaundiced temper, but "rose-colored" to his more happily constituted neighbor; while "blue" is the permanent color in which the despondent mood regards every situation and prospect. Even our ethical, æsthetical, philosophical, and religious ideas and judgments are tinged or saturated with our peculiar and characteristic kinds and tones of feeling. The most abstract and metaphysical pessimism or optimism has been declared to be a matter of "temperament" chiefly. Caprice itself is a disposition constituted largely of tendencies to certain forms of quickly changing feeling. In general, then, *the character and the magnitude of the feeling excited depends not so much directly upon the kind and quantity of the excitement applied, as indirectly upon this through the relation which any particular excitement sustains to the direction and intensity of the general sensibility.*

Another group of most important psychical conditions of all feeling concerns the distribution of attention. What we feel, and what is the tone of our feeling (whether pleasurable or painful), depends largely upon the actual matter of fact: the particular sensations, perceptions, ideas, thoughts, nascent or vigorous purposes, upon which our attention (whether voluntary or involuntary) is focused; and the degree of smoothly running flow, or of interruptions and shocks, to the current of consciousness, with which this attention is distributed. But this, in turn,

depends upon a great variety of permutations and combinations possible among the factors which constitute, at any instant, the condition and the direction of this same current of consciousness.

Other more particular conditions of the tone of our feelings as "pleasure-pains" will receive consideration later on.

§ 5. The attempt of biological and physiological science to state accurately the physiological conditions of all feeling is, of course, most commendable. It is only when this attempt results in reducing the whole vast wealth of human affective experience to *quanta* of pleasure and pain, measurable according to Weber's or some other law, and dependent upon intensities of nervous processes, that it merits the distrust and contempt of the philosopher, the artist, the religious enthusiast, the more genial and comprehensive psychologist.

Our view, which finds the physiological conditions of feeling in the "semi-chaotic surplus" of nervous processes originated by stimuli, but regarded as *relative* to the tendencies of the entire molecular central mechanism—though confessedly not capable of direct scientific proof—is a conjecture borne out by many considerations. Among the most obvious of these is the character of those processes which accompany the rise and development, the "building up" in consciousness, of all the more intense states of complex feeling. But this will have to be considered in more detail when we treat of the emotions and sentiments.

(1.) The character of those bodily feelings which enter so largely into the complex "feeling of self" and into what we call our "temper" or "mood" is explained according to this conjecture. The constitution of the internal organs, and their relation to the cerebro-spinal nervous system, are such that sensation-complexes which can be built up into knowledge by perception are only sparingly derived from these organs. One knows by immediate perception very little of the size, shape, temperature, and motion of one's intercostal and visceral extensions and surfaces. And what little one senses here is apt to be submerged under accompanying feelings with a strong tone of pleasure or pain. But from all these organs, through the nerve-plexuses and nerve-tracts of the great sympathetic system, an indescribable *mélange* of nerve-commotions is ceaselessly ascending through the cerebro-spinal tracts to the brain. What this *mélange* is at any particular time depends upon what kind of intercostal and visceral organs one has inherited, or acquired by good or bad habits, or had forced upon him by happy or unfortunate accidents or circumstances, or got by the action of the last hour or of yesterday. This *mélange*, however, gives conditions to one's affective disposition, or mood, or temporary impulse, so far as it is a matter of bodily feeling. When this *mélange* corresponds with that to which we are habitually accustomed, we feel "like ourselves;" when it corresponds to any one of several familiar characteristic types, we feel in one of our several "moods;" when it is largely unaccustomed, we feel "queer" and "not a bit like ourselves." In all cases it is the "surplus" of peripherally excited nerve-commotions, whose character does not admit of their being organized after the form of excitations derived from the external organs of

sense ("semi-chaotic," as we have called them), which largely determines how we "feel" at any particular time. Moreover, every such particular *mélange* of nerve-commotions finds the central nervous system, on entering into it, *engaged* in a particular but highly complicated way. The influence of the bodily feelings upon our total state of feeling is therefore by no means always dominant or complete. Sensations, ideas, purposes, and—as the development of mental life goes on more and more—ideal aims determine how we feel: sometimes, in spite of and in triumph over, our bodily feelings.

(2.) Again, from the lower parts of the cerebro-spinal axis (from spinal cord and lower brain-centers) a complex crowd of nerve-commotions—part of which arises from the influence of the end-organs of sense directly upon these lower organs and part from changes originated within the organs themselves—constantly arises to the higher brain. This crowd of nerve-commotions is ever freighted with a "surplusage"—a "semi-chaotic" *quantum*, which is not adapted to be elaborated into the sensuous basis of definite perceptions and ideas. This, too, gets expression for itself in the complex life of feeling. Hence those feelings of bodily equipoise which are so helpful to the feeling of mental equilibrium, and which are largely dependent upon the activity of the cerebellum and semi-circular canals. Here belong, in large measure at least, the physiological conditions of the feeling of *repose* (a feeling so difficult to realize with a reeling gait or an unsteady head), the feeling of *excitement* or *confusion* (when unelaborated sensation-complexes are rapidly hurled, as it were, from the lower cerebral regions up to the hemispheres of the brain), the feeling of *dubitation* or *negation* (connected by association with the movement of the head). Hence, especially, arise the forms of feeling most inseparably connected with the use of the higher senses.

(3.) Indirectly, too, our view throws light upon the physiological conditions of our feelings of relation. The principle of relativity has been applied by modern psychologists (especially by Mr. Spencer) to all our states of cognition. But it was propounded with respect to the feelings of pleasure and pain even earlier (by Cardanus) than it was formulated as a general psychological principle (by Hobbes). As Höffding truly says: "It makes its appearance here even more plainly than in the province of cognition." The physiological reason for this is at once obvious when we consider that it is *changes* in the nervous processes, *relative* to each other, and to the complex situation in the midst of which they occur, that constitute chiefly the very essential physiological pre-conditions of all feeling as such. We get light upon this truth also by considering what feelings go with smooth and slow changes in the same direction of nerve-excitation; what with sudden and abrupt changes, etc. Or, again, let it be inquired, "How do I feel when the present total complex of solicitation from all the different stimuli "fits in," or not—as it were—with my disposition, my present mood; or how toward one object or form of sensation or ideation which comports, or not, with the others constituting my total environment? Does not every one promptly and keenly feel *change* in the complex of his nervous excitations (the *new* sensation, idea, resolve, or feeling)? Even *ennui* or monotony depends upon

the sensations or ideas occurring and recurring in the stream of consciousness so as to make their similarity felt. And does not the character of our feeling depend upon the *relation* in which the new sensation or idea stands to that current of nervous excitations which supports the states of consciousness when the new factor or object appears? Feelings of *surprise* or shock, of *novelty*, of *expectation*, of *recognition* (pleasurable or painful), of vague *dread*, or *longing*, etc., find their physiological conditions accounted for by application of this principle. In general, no marked and prolonged state of feeling can exist except in dependence upon considerable change in the direction of the excitement of the nervous centers under the influence of external and internal stimuli.[1]

(4.) Even in the case of those simpler and less intense feelings which are connected in experience with the particular sensation-complexes and ideas, it is probable that this same principle holds true. Each activity of every organ of sense may be said to awaken a "surplus," however small, of nervous excitation which may serve, under the right conditions, for a feeling over and above, and yet connected with, the sensation-complex or idea. Whether such neural surplus awakens conscious feeling, and what feeling it awakens, is relative to ("depends upon") the entire habit, or present mood, etc., of the person concerned. Two men, neither of whom is color-blind, will have the same sensations on looking upon a colored object; but who can tell what their feelings will be, even when the object is as near as possible to an object with fixed associations? Their feeling, on seeing green or orange, "will depend upon," etc. Two men, neither of whom is tone-deaf, will hear the same notes on listening for the first time to Beethoven's quartet in C Sharp Minor (opus 131); but who can tell what the feelings of either will be? This "will depend upon," etc.

(5.) The painful feeling which is evoked by too intense excitement of any, even very limited, area of the surface of the skin has also, it is probable, its physiological conditions in confused commotion of the nervous substance, "a troubling more or less profound of the organism." The feelings evoked by sudden and uncertain changes in the application of the stimuli, or by constant slight irritations of the nerves which serve no purpose of clearly organizable sensation-material, are due to the same cause. The pleasant and painful affective phenomena produced by being stroked, rubbed, tickled, passively moved, or other similar forms of stimulation, may be noted in this connection. Every worker in the laboratory knows how the same vibrating fork, or finger marking upon a revolving drum, may produce not unpleasant sensations of sound, when attended to as an object which interests us; while it will occasion a large amount of latent feeling of irritation when it has ceased to serve as an instrument of clear knowledge. The "semi-chaotic surplus" of nervous excitement, caused by the rubbing of the clothing, or by the pressure of the chair, is felt as making us cross or weary, when we have no definite sensations and perceptions arising from these sources.

§ 6. At certain epochs in life, changing bodily conditions become the causes of persistent but vague feelings which amount to a "mood" or "disposition," and which serve to color all the sensations and ideas. This is

[1] The proposition that it is *changes* and not conditions of the nervous system which are felt is argued at length by Horwicz: Psycholog. Analysen, iii., p. 43 f.; Nitsche: Versuch einer einheitlichen Lehre von den Gefühlen, p. 9 f.; and Paulhan: Les Phénomènes affectifs, etc., p. 66 f.

particularly true of the development and physiological activities connected with sex. Thus attention has been called by many writers[1] to the vague feelings of *want*, *disquiet*, *melancholy*, or *ennui*—all of them without any clear connection with definite sensations and ideas—which mark the epoch of puberty. But all four of the great periods of life (childhood, youth, manhood, and old age) have their characteristic tendencies to particular kinds of feeling, or to particular changes in the life of feeling. And so far as the physiological basis of these characteristics can be traced, it seems to conform to the principle we are illustrating. The rapid metabolism and circulation of the infant, and the sluggish digestion and circulation of old age, modify differently the character of the changes in the excitements of the nervous system by way of what we have called a "semi-chaotic surplus" relative to the entire life of this system.

§ 7. Feelings similar to those called out by way of reaction upon external stimuli accompany the psychical changes. Here we are to recognize the significance of many of our most primary intellectual processes. Mr. Spencer is certainly not warranted in resolving the whole of what we call "judgment" into a mere "feeling of relation"—itself timeless and yet existing between two psychoses which last through extended time. Nor are the Herbartians warranted in arguing, because feeling is no special idea in conjunction with others, nor an idea in general, therefore it is *only* the consciousness of the "tension" of the process of ideation, considered as a struggle between related ideas. But both Mr. Spencer and the Herbartians are right in calling our attention to the truth that, in general, all the intellectual processes have their characteristic accompaniments of feeling; and that the character of this feeling depends upon the changing relations between the factors and wholes of our intellectual processes. *One feels, as well as knows, the flow of the current of consciousness.* Indeed, so true is this that all the different parts of speech, as employed in their changing relations to each other, evoke different shades of feeling more promptly and more certainly than they evoke different definitely distinguished sensations, ideas, or thoughts. That the flow of feeling which accompanies all language, and which depends upon the changing sensations, images, and ideas, is even the most primary and permanent thing in mental life, as excited and expressed by language, although—as we have seen—this is not the design or end of language, there are many grounds to argue. Children *feel* what they read or hear read, or said, with an appropriateness which quite outstrips their powers of understanding. For example, the feeling of impulse to comply may be aroused in them by a certain way of saying the words "Come—do;" the feeling of repulsion by a certain way of saying the word "No." Poetry that is far above their childish comprehension, while it presents to them few vague pictorial conceptions, by the pleasurable rhythmic flow of sensations may awaken a high degree of appropriate æsthetical and ethical feeling. Music, in the form of the opera or (more especially) the oratorio, makes use of this truth; for it applies not simply to childhood, but to the most cultivated minds when they voluntarily abandon themselves to the skilful leader and inspirer of affective consciousness. Witness the complex

[1] Compare, for example, Esquirol: Maladies mentales, I., p. 553. Griesinger: Traité des Maladies mentales, p. 236.

æsthetical feeling awaked by hearing the "almost toneless low note of the tenor voice" on the last word of the passage, "He turned their waters into *blood*," in Handel's "Israel in Egypt."

In all purely instrumental music the flow of consciousness is thin and meagre, so far as definite conceptions go, but the changes in key and the rhythmic flow of sensations of musical sound are *felt* with an astonishing wealth and power of conscious being. This fact is connected with that "interiorness" of these sensations, on which we have already remarked. Indeed, at times it may well seem as though all objective reference and all "training" of the ideas had nearly ceased; we simply have our being totally in the flow of musical feelings. What happens through the sense and ideation belonging to hearing is also true of sight. The physical and objective changes which gesture and physiognomy present to the eye are productive of feelings of fear, joy, attraction, repulsion, surprise, expectation, longing, solemnity, etc., to the child; and this on a basis of extremely slender mental elaboration. And here adults are not so unlike children. Indeed, the cultivation of "tact" depends upon the prompt and appropriate arousement of sensibility as the accompaniment or sequence of meagre intellectual processes.

In all these cases feeling and ideation, or thought, react on each other. This truth obtains in all ranges of culture, from the ignorant woman who, as tradition affirms, wept at the "holy wag" of Whitfield's head, to the cultivated sceptic who turned from feeling the beauty of a natural scene to the conclusion that there must be a God. But the fuller treatment of the higher forms of feeling will cause us to recur to this truth.

The principles which must guide psychology in the Classification of the Feelings have already been pretty clearly indicated. From the very nature of feeling in general we are obliged to resort to those "objective" processes with which feeling is connected, in order to locate in intelligible "kinds," or "sorts," the affective phenomena. In other words, we classify the feelings by reference to the intellectual processes which accompany or occasion them. All attempts at a purely biological or physiological classification of the phenomena of feeling are, especially, to be rejected. Such principles of classification have no place at any point in psychology; but they are especially out of place at this point, because the most essential characteristic of our feelings renders it inconceivable that they should differ after the analogy of the physical organism or of the physiological processes.

It is further important to determine the exact character of the Relations in which the Feelings stand to the other two main Classes of mental phenomena. We are wont to speak of our sensations, ideas, thoughts, and purposes as *being themselves* either pleasurable or painful. Thus those who identify "pleasure-pains" with the whole being of feeling seem compelled to regard feeling as a *quale*, or characteristic, of the other forms of mental

life. And even those who deny this "identity" theory, if they also deny all neutral feelings, are inclined to think of feeling (as respects its tone of pleasure-pain) in the light of some kind of "attachment," or "qualification," to the other aspects of consciousness. But obviously this is not, strictly speaking, consistent with the view that intellection, conation, *and* feeling are three inseparable and alike fundamental aspects of every total psychic state. Here we may not improperly notice that popular language recognizes similar "attachment," or "qualification," working—as it were—in the reverse direction. We speak, for example, of sensuous, or intellectual, or ideal pleasures and pains; we might even, not improperly, speak of voluntary or involuntary, forced or chosen, feelings of whichever prevalent tone. That is to say, the "attachment" of feelings to intellectual processes (by means of which alone we are able to classify feelings) does not necessarily signify the subordination of the former to the latter; it does not mean that feeling has no independent and specific being of which we must take account. Such "attachment" may be only of a kind which prevails in all mental life. For example, when I have a "painful sensation" at a certain place in my finger, or in a certain tooth, the sensation and the feeling belong, psychologically considered, to two different classes of mental phenomena. They are, indeed, "fused" (if this somewhat indefinite word may be permitted) in the total content of consciousness. One may express this fact either by saying, "a painful sensation" or a "sensuous pain." So, too, when one is grieving over the loss of property or of a friend, one may express the total fact of "fusion" either by saying, "a painful idea" (or thought), or "an ideal or conceptual pain."

This juncture between our feelings and the objective and intellectual processes, which afford us the means of classifying our feelings, is effected with varying degrees of promptness and completeness. Sometimes, as in the case of painful touch, it seems (but never is) immediate and complete. But sometimes the "objective" attachment of the feeling is vague and indefinite, as in the case of many of the more diffused and yet unlocalized feelings of bodily comfort or discomfort, of ease or uneasiness, and the like. Again, the feeling may even precede the clear determination of the correlated process of sensation or ideation in consciousness; and this is the case when we are surprised, startled, or shocked by any abrupt and great change in the character of our sensation- or ideation-experience. Yet again, feeling may come lagging on behind the development of the objective processes to which—as we are wont to say—it appropriately

belongs. This experience is so familiar in the case of our more complex forms of feeling that it has led to the mistaken psychological theory which makes all the affective phenomena of consciousness dependent upon an "occasion" being furnished for them. But the general truth is, that in the flow of the one stream of conscious life *the feelings may assume either one of the three possible time-relations toward the sensations and ideas by which we classify them;* they may fuse with them in the "now" of the same conscious state, or they may lead or follow them.

One other consideration affects all attempts at classification of the feelings. Changes in the complexity and intensity of both the "objective" and the "affective" factors of any mental state which is predominatingly one of feeling, produce important changes in the resulting compound quality. Thus new and higher "classes" of feeling are determined. By increase of intensity, for example, a feeling of pleasant mild surprise, scarcely distinguishable from the feeling of novelty, becomes the emotion of wonder or of astonishment. But no such change is a mere growth of affective intensity. A great variety of *qualitatively* new factors modify the character of the complex state of feeling as any considerable increase in intensity takes place. Especially is it true that the whole tone of the feeling may change: for example, the emotion corresponding to a pleasurable feeling may be a painful emotion. Thus, too, out of surprise, as it were, may be developed wonder and astonishment, or dread, or anger, or joy. Even pleasure and pain—such "opposites" as we are wont to call them—sometimes struggle together for the possession of the field of affective consciousness, and thus produce a most strange complexion, by their very struggle, to that field.

Combining the foregoing three considerations we find that the Classification of the Feelings may proceed as follows:

I. According to the "objective" accompaniment, or reference, of the feeling—into (1) Sensuous Feelings, or such as have their difference determined in dependence upon the different qualities of the sensations of the special senses and of so-called "common feeling"; (2) Intellectual Feelings, or such as have their difference determined by the character of the processes of ideation and thought; (3) Æsthetical Feelings, or such as arise in connection with the perception or imagination of what we call "beautiful" or its opposite; and (4) Ethical Feelings, or such as arise in contemplation of those forms of conduct which we call "right" or its opposite.

Two things should be borne in mind as respects this division:

Inasmuch as the whole principle of division is one of "objective" reference, all these forms of feeling are "intellectual," in the broader meaning of the latter word. That is to say, they all involve intellectual discrimination of some object with reference to which the quality of the feeling is determined, or in connection with cognition of which the particular feeling is felt. But, second, the two latter classes of feelings cannot be wholly separated from dependence upon the two former. All our æsthetical and ethical feelings depend upon a basis of sensuous and intellectual feelings.

But inasmuch as the character of the "attachment" which each feeling has to the intellectual aspect of consciousness varies greatly, we may divide the feelings into:

II. Either (1) Statical, or Feelings attaching themselves immediately to the content of the sensations or ideas, so as to fuse with them in such form that introspective analysis discovers no time-difference between the affective and the corresponding intellective aspect of consciousness; or else they are (2) Relational, or Feelings which have their quality determined by the changes that take place in the flow of sensations or ideas—"feelings of relation," that vary in character according to the character of the relations between different successive sensations and ideas. In this latter case we customarily speak of the content of discriminating consciousness as the "occasion" of our feeling thus and so.

Finally, we may divide affective states into:

III. Either (1) Simple Feelings, or such as do not admit of introspective analysis into several elements or factors; and (2) Complex Feelings, or such as blend a number of qualitatively different kinds of feeling into one predominatingly affective state of consciousness. Upon this third principle of division it must be remarked, first, that all states of adult consciousness which are characterized by some predominating aspect of feeling are really complex; and, second, that changes in intensity of every kind of feeling result in the admixture of other affective factors into the compound state.

§ 8. We return at this point, briefly, to the consideration of the disputed question: Whether the feelings, as such, differ in quality and thus warrant our allotting them to different kinds. Our affirmative conclusion may now be enforced by considering that the opposite view compels us not only to affirm the likeness, as feeling, of all the simpler forms of affective consciousness (*e.g.*, that the feeling of pleasant surprise *is*, as feeling, like the feeling of equally pleasant expectation; and both these *are*, as feelings, like the feeling of sensuous pleasure which one has when one grades to exactly the same

scale of pleasure the sugar in lemonade), but also to hold that the simplest bodily pleasures, as feelings, are like the most elevated intellectual, æsthetical, and ethical pleasures—provided the two can be made to assume the same locality in the "pleasure-pain" scale of quantities. It will be a long time, however, before psychology convinces the artistic mind, on seeing a great actor play Hamlet, or on hearing the "Erl-King" of Schubert, that its feelings, *as such*, are simply pleasure-pains that may have an exact equivalent in so much pork and potatoes, or cheese and beer. Nor is he who has felt that joy of scientific discovery which Niebuhr compared to the divine feeling in view of a new-made universe, likely to confuse it, as respects distinctive quality, with the sensuous thrill of gratified bodily appetite. While the religious devotee will scarcely fail to relegate his "love of God," or his feeling of "divine pity," *as an affection*, to a different class from that into which he throws all sorts of "pleasure-pains" derived from physical goods and evils.

§ 9. On account of the obscure character of the sensuous basis on which the intellectual, æsthetical, and ethical feelings repose, writers on the psychology of art and morals have often failed to recognize this basis. On the other hand, those writers who, starting from the biological point of view, attempt to deal with the higher feelings in accordance with a theory which resolves all their affective quality into quanta of "pleasure-pains," almost uniformly find their theory, in reality, quite too narrow for them. For example [1]—to illustrate from one of the most judicious of modern psychologists—we are told at one moment that, "strictly speaking, there are only two varieties of feeling, viz., the agreeable and the disagreeable;" because "all our feelings are constituted by elements of pleasure and pain;" and then, at another moment, we are informed that "the several varieties of musical sensation . . . have distinct affective concomitants," some of them producing the feeling of excitement or exhilaration, while others produce feelings that have a "quieter and graver character." And after virtually affirming the many varieties of our simpler sensuous feelings, we find this author proceeding with the further classification of complex feelings, just as though the "pleasure-pain" theory had never been introduced. The popular view is, on this point, psychologically correct. "A finer scientific analysis" brought to bear on the "feeling-concomitant" of our sensations and ideas, *does not* resolve those popularly recognized differences into something else than what every subject of the feeling immediately feels them to be.[2] And to hold that it does, destroys all basis for our judgment as expressed in terms like the following: An "honorable" or a "base" *feeling*, a "fitting" or an "inappropriate *feeling*," etc. It also makes psychologically unintelligible all the affective phenomena which enter into the constitution and the appreciation of artistic products, and of conduct considered as moral or immoral.

§ 10. *Sensuous feelings* "attach themselves" to the activity of the senses in such a way as to fuse with the sensations, with their presentative or objective reference, and so constitute their "subjective" side, as it were. When, then, we speak of pleasant or painful *sensations*, the noun empha-

[1] See Sully: The Human Mind, II., pp. 46 and 51.

[2] On this point comp. Horwicz: Psycholog. Analysen, III., p. 91 f.

sizes this presentative or objective reference; but when we speak of sensuous *feelings*, the noun emphasizes the subjective aspect, generally of either pleasure or pain, which fuses with our sensations, or is recognized as occasioned by them. But here we notice a marked difference between the feelings which accompany the activity of the special senses and those occasioned by the unlocalized *mélange* of intraorganic sensations (the "common feeling," or "feelings of organic life," as they are sometimes called). For example, the velvet feels pleasantly smooth to the adult; the mother's cheek or breast pleasantly warm and soft to the infant's hand. But one has an undefined feeling of *malaise* in which certain vague intestinal or cardiac sensations are occasionally discriminated; or one feels "full of vigor and life," with scarcely a trace of that objective reference to free circulation, deep respiration, unimpeded action of well-nourished and well rested muscles, that are the concealed underlying sensuous basis of this feeling.

Enough has already been said as to the reasons for the difference just mentioned. We therefore assume it, and go on now, briefly, to characterize with more particularity some of the qualitatively distinct classes of sensuous feelings.

(1) The distinctions of feeling accompanying our sensations of *smell* and *taste* are not numerous or easy to make, apart from the consideration of their agreeable or disagreeable tone. Yet even here *the way we feel* is not by any means precisely the same for all equally pleasurable, or equally painful, tastes and smells. Some agreeable sweet odors are described as "heavy," and others as having an "enlivening" or "spicy" quality (for example, we may here compare the "affection" produced by the heliotrope and the Japanese lily, to one who finds both agreeable). Not all equally disagreeable tastes and smells are, as considered in the light of the feelings they occasion, the same; some are "exciting," some "depressing," etc. The "language of flowers" and the emotional significance of certain dishes is no doubt largely fanciful; it is, so far as the connected ideas and the agreeableness or disagreeableness of particular examples are concerned, largely a matter of association. Still the actual difference in the quality of the accompanying affective phenomenon must not be wholly overlooked. Besides, on due occasion, all the feelings of relation, such as surprise, curiosity, novelty, interest, active like or dislike, may be induced in connection with these sensations.

(2) The feelings which accompany the different markedly unlike sensations of *touch*, *temperature*, and *muscular* activity, are susceptible of a certain difference in kind. Pleasant coolness is "refreshing;" pleasant warmth is "cherishing." The slow regular use of the large muscles calls out feelings of physical "gravity," or "equipoise;" it even underlies the feeling of personal importance and dignity. We hop, skip, and jump when we are gay; and, conversely, the feeling *of* such use of the muscles is called one of "levity," "freedom," etc. How delicious and "pampering" is the feeling of the soft cushions; and how does the feeling of primness support itself by the upright posture in a straight-backed chair! How pitiful the condition of the child who has never known the comfort of "cuddling" in the big sofa by the fire—a feeling of comfort both like and unlike that produced by having eaten just enough of an excellent dinner.

(3) Musicians have always attached different distinct kinds of feeling to different musical instruments, to the different *timbres* of notes when sounded to express difference of feeling, to different keys and chords. However much of this is due to fanciful associations, it is scarcely all thus to be explained. And it certainly is *not* to be resolved into mere differentia of the pleasure-pains of acoustic sensations. Stumpf[1] tells us how his son Rudolf, a child of four and a half years, when he had to choose between two trumpets that differed by a tone, declared for the "darker one." The "grave" feeling belonging to the base register is different, otherwise than in mere quantity of pleasure-pain from the "stirring" of the tenor. The "sweet-pain" of minor strains is not the same mingling of the two opposites, as that which a chord has where one of the keys is somewhat out of tune. And the feeling of "grace" which belongs to Mozart's Opus 46 in E flat is different, though no more or less pleasurable, and though we disregard the character of the notes as *mere* sensations, from the feeling of "passionate fervor" which belongs to his Opus 47 in G Minor.[2]

(4) The varieties of feeling which belong, as the affective concomitant, to the different sensations of *color* and *light* have, indeed, been differently described by different persons equally susceptible to this form of excited sensibility. Here, then, as in the case of all the other feelings, disposition and association have largely to do in determining kind. But here also a certain rather wide range of distinction seems to belong to the more primary phenomena of feeling. Bright light and mellow light produce differences in the character of the equally pleasurable feeling which may result; melancholy may deepen into vague dread, as twilight gives way to total darkness, without habit and association furnishing the complete account. As respects the fine shading of tones of feeling accompanying the color-sensations, the classical passage of Göthe is in proof. With the "cheerfulness" of yellow the "mournful" light seen through blue glass is contrasted—"a feeling of cold" ("as recalling shadows," the author adds). Green produces the impression of repose; red of strong excitement. [The explanation which accounts for the exciting influence of "red" upon some animals, by its association with the sight of blood, seems not wholly satisfactory. The reason lies, in part at least, in the amount and character of the neural "semi-chaotic surplus" which these rays provoke.] Höffding, combining these two forms of sensations of sight, calls upon us to observe how, with diminished or augmented illumination, "the effect on feeling sustains a corresponding change."

(5) In addition to what has already been said respecting that compound bodily feeling called "common feeling," as the affective concomitant of certain obscurely *sensed* organic processes, we may now note that it has a number of distinct kinds, both painful and pleasurable. The equally disagreeable

[1] Tonpsychologie, II., p. 581.

[2] The extreme position taken by many especially susceptible to musical feeling, however unjustifiable in details, bears witness to the validity of distinctions in the quality of the "affective concomitants" of acoustic sensations. Thus E. T. A. Hoffmann would characterize each chord by a special state of feeling; B Major expresses "harmless joy;" C Major, wild desire; A flat Minor, longing, etc. So also Jahn explains the blended feeling which Mozart's March in his Zauberflöte causes as due to the "weak and depressed Klang" of certain instruments, which the flute renders "clearer and milder," and to which the horns and trumpets give "power and fulness." *We note that it is of the very essence of feeling that such descriptions should not command universal assent.*

tone of feeling differs in kind according as we feel vague uneasiness due to intestinal disorders, the slightly painful excitement of the fever of tuberculosis, the undefined dread that arises from unhealthy action of the heart, etc. The pleasurable feeling of comfort from wholesome, pervasive warmth, the equally pleasurable feeling of genial excitement from moderately quickened vaso-motor activity, and the not greater enjoyment of passive exercise in the hands of a skilful shampooer, are more or less distinctly different kinds of bodily feeling, accompanying an almost indistinguishable *mélange* of sensations.

§ 11. For the development of mental life our feelings become more significant and important as they increase in complexity and in their relation to ideal ends; and this, of course, implies a more intricate dependence upon the accompanying growth of ideation and thought. Here one principle is important: *The character and rate of the change which takes place in the sensational and ideational elements of consciousness determines certain characteristic "feelings of relation."* These feelings are the same in kind whatever may be the particular sensations or ideas whose relation determines the particular case. One class of such feelings, for example, is dependent upon the sudden and unexpected character of the change. Hence arise feelings of novelty and surprise, with all the shadings of the latter as it is intensified into astonishment and wonder, or deepened into dread and awe. Here the play of emotions in a crowd, when some abrupt change takes place in the fireworks they are watching, is instructive. With these may be contrasted those feelings which accompany the continuous flow of similar sensations and ideas, free from all abrupt and impressive changes. The name of "feeling of continuity," or of "continuous similarity," might be given to this class. On the one hand it is related to the pleasant feelings of familiarity, of being "at ease," etc.; on the other hand, the unpleasant feelings of monotony, weariness, and restless longing for change, may be developed.

The time-rate of the changing sensations and ideas determines the classification of other of these feelings of relation. A very slow rate of change in the objective processes is apt to be accompanied with pleasant feelings of languor and mental drowsiness, or with unpleasant feelings of depression of spirits, tedium, and the like. A moderate, equable pace to the sensations and ideas is apt to be accompanied by a feeling of pleasurable excitement, which rises in intensity until these objective processes take on too rapid a time-rate; then emerge those painful feelings of confusion, of being in a whirl, of being "run away with" by one's own thoughts, which sometimes bring the mind to the very verge of insanity. Indeed, the affective phenomena which characterize "melancholia," on the one hand, and "mania" (to use the term as German psychiatry employs it), on the other hand, are largely dependent upon the time-rate of the processes of sensation and ideation. Similar characteristic feelings are with us when we are "dull" or "brilliant," etc. The influence of certain drugs on the emotions comes largely through the effect of quickened or retarded cerebral circulation upon the time-rate of the mental processes. Nor would it, perhaps, be untrue to the facts of experience if we were to speak of a vague general feeling of "expectation," as induced by every relative condition of pause, or cessation, in the flow of the stream of consciousness. This feeling, though closely

connected with the feeling of surprise, does not seem to be precisely the same. Where the present sensation or idea gives some token that the future state will be pleasurable, the feeling of expectation itself may be pleasurable, may take on the tone of hope or joy; but where something disagreeable is expected, the feeling of expectation assumes the form of aversion or dread. But mere prolonging, or closely frequent repetition, of expectation itself results in evoking the feeling of impatience, which is as distinct in quality as any feeling well can be.

The permutations and combinations of all these more primary forms of the feeling of relation are rather indefinite, and the special sensations and ideas which serve as their occasions mark by their variety the difference between individuals and between different stages of the development of the same individual. But that such primary forms are, *as feelings*, qualitatively unlike, and that these differences accompany changes in the time-rate of their sensational or ideational "occasions," there seems no room for reasonable doubt.

[Reference to works on the psychology of feeling will be found at the close of the next chapter.]

CHAPTER X.

FEELING, AS PLEASURE-PAIN

PSYCHOLOGISTS and philosophers in all ages have been accustomed to call attention to the great significance of pleasure and pain in human life. We have already seen how modern theory identifies these two opposing tones of consciousness with the whole character of affective phenomena. Art, of course—especially in the forms of music and poetry (with their accompaniment of rhythmic movements in marching and dancing)—is adapted to arouse and to express our pleasurable or painful sensations, emotions, and sentiments. If we employ the two words "pleasure" and "pain" (as is now customary in psychological writings), to include all degrees and kinds of the agreeable and the disagreeable, existence itself seems to have its interest and value largely in these phenomena. And when we consider the indirect result of pleasures and pains upon cognition and conduct, we may well exclaim: "It is difficult to conceive what life would be if pleasure and pain were stricken out. . . . leave them out, and life and the universe no longer have meaning." Hence biology sometimes strives to show how all special sensations may have developed from an original of pain or of pleasure; while political science does not cease reminding us that Schiller's "Hunger and Love," as pains and pleasures belonging to brute instincts, still largely drive men to their work and sway the nations.

It is not our present purpose to call attention to the rather depressing exaggeration which much of this way of stating the matter involves. We believe that not even the simplest and rudest psychological development, the lowest and meanest exhibition of so-called human nature, can be explained as due to the mere repulsion of pain and the allurement of pleasure. We wish, however, now to note how extensive, fundamental, and influential is that, in most of our feelings, which we designate as "pleasure-pain." In accordance with the discussion of the preceding chapter we speak of pleasure and pain as opposite "tones" of feeling—both alike "positive," each clearly distinguishable from the other, and each capable of varying indefinitely in inten-

sity. In answer to the question whether all feelings, absolutely without exception, are—to some extent at least—either pleasurable or painful (in other words, whether "neutral feelings" exist), no decisive theoretical answer seems possible.

§ 1. The discussion over the existence of "neutral feelings" has probably absorbed more attention of late than it deserves—especially if we separate it from the far more important discussion of the nature of all feeling as such. Neutral or indifferent feelings were recognized by Reid, but disputed by Hamilton.[1] James Mill went so far as to assert that the greater number of our sensations are colorless as respects pleasurable or painful feeling—are "indifferent" in tone. Bain[2] asserts it as undoubted that "we may feel and yet be neither pleased nor pained;" and that "almost every pleasurable and painful sensation and emotion passes through a stage or moment of indifference." Wundt argues that inasmuch as pleasures and pains differ in intensity and are opposites (and may, therefore, be plotted as having a place on either side of a curve which crosses an abscissa-line) there *must* be a point of indifference, or neutrality, lying between them. But this argument assumes that because a curve represents certain relations, in respect of intensity, in which pleasures and pains stand, therefore it represents all their relations to one another and to all states of feeling. A child stung by a bee while eating honey may be figuratively represented as passing along this line; and yet it does not follow that because extreme pain follows great pleasure an ideal neutral feeling intervenes between the two.

Returning to experience, we find another recent writer[3] exclaiming: "How many visual images, musical sounds and noises daily throng our consciousness? How few of them are associated with any feeling (that is, positive feeling of pleasure or pain) whatever!" And doubtless the experience of most men would, naïvely expressed, agree with this exclamation. If in fairly good health and occupied with work sufficiently exacting of attention, but not too distasteful or too absorbing, they pass the larger part of their time without observable tone of pleasure or pain characterizing the stream of consciousness. We here see again reason for not adopting even the modified statement of Lotze: "We apply the name 'feelings' *exclusively* to states of pleasure and pain in contrast with sensations as indifferent perceptions of a certain content." Perhaps, if we admit that there are few, if any, of our feelings (especially the sensuous) in which we cannot, by purposive attention, develop a discernible tone of feeling, that is, make them to appear either slightly pleasurable or slightly painful, yet, on the other hand, that a large part of our affective phenomena leave no distinct trace in consciousness, or on memory, as either pleasurable or painful, we shall state the facts on both sides. Nor—we repeat (see p. 171)—is there anything in our feelings, as such, to show reason why any uniform law should be observed in this regard.[4]

[1] See Works of Thomas Reid (Hamilton's edition), p. 811.

[2] The Emotions and the Will, p. 13.

[3] Ziehen: Introduction to the Study of Physiological Psychology, p. 180.

[4] Those who desire detailed discussion of this *Crux* in psychology (so Sully) may refer to Fr. Bouillier: Du Plaisir et de la Douleur, chap. viii.; and articles in Mind, xiii., pp. 80 ff., and 248 ff. and xiv., 97 ff.

The Conditions, both physiological and psychical, which determine the tone of our feelings—whether as feelings of Pain or feelings of Pleasure—cannot as yet be reduced to any one principle. It does not follow from the "opposite" character, psychologically considered, of pleasure and pain, that their physiological conditions are to be found in opposed processes of the nervous organism. To call pleasure "positive" and pain "negative," or the reverse, only confuses investigation; no light whatever is thus thrown upon the problem from the psychological point of view. To the subject of the feeling, pleasure and pain are alike real and positive—opposites, to be sure, but in no such way that an indefinite number of degrees of both do not occur, or that the two tones of feeling may not blend and modify each other, especially in our more complex and highly developed states. Biology, as studied from the evolutionary point of view, throws only a very uncertain light over that problem which it defines as "the origin of our pleasures and pains." It assists psychology in showing how increased amounts of pleasure or of pain may become *attached* to certain forms of physiological function, because of the service which pleasurable and painful feelings render to the preservation of the individual and to the propagation of the species. It also offers more or less valuable conjectures as to how some of the most elementary vital and intellectual processes have come to be associated with the one or the other of these two "tones" of all affective phenomena. But both biology and psychology are obliged to *assume* the existence of pleasure and pain, as well as the peculiar place which "pleasure-pains" sustain in the total mental development. This assumption would have to be made even if we knew precisely (as we do not) the universal and unalterable physiological preconditions of all pleasure-pain.

§ 2. If we were at liberty to regard even our bodily pleasures and pains as specific forms of sensation, with a distinct nervous apparatus having particular *loci* in the surface of the body, where stimulus needed to be applied, the task of specifying the physiological conditions of *some* at least of our pleasure-pains would be simplified. The attempt to do this has recently been made by use of experimental methods, particularly for pains connected with sensations of the skin. But even in this limited way the attempt has not succeeded. One observer of high rank [1] has indeed claimed to discover certain "pain-spots" (akin to the pressure-spots and the temperature-spots), to the excitement of which alone sensations of pain are the

[1] Goldscheider. See Archiv f. Anat. u. Physiol. (Physiolog. Abth.), 1885. Sup., p. 87. That specific organs of pain exist in the skin is denied by Blix (Zeitschrift f. Biologie, xxi., p. 160), and held not proven by Wundt (Physiol. Psychologie, I., pp. 302 f. and 496 f.), and by most other observers.

specific response. But subsequent observations and the opinions of other authorities do not sustain his claim. An argument for this view is derived from the undoubted fact that the sensation of touch and the feeling of pain, in cases of painful touch, are separable both in fact and in time. Thus disease may occasion insensibility to pain (*analgesia*) without insensibility to touch (*anæsthesia*), and conversely. Severe cold may render the amputations necessary after battle almost painless, even when the patient senses the operation as being touched and cut. Chloroform and hypnotic sleep sometimes render the subject insensible to the pain of sensations (such as that coming from extracting a tooth, or from burning the flesh) without destroying the sensations as such. Moreover, Weber called attention to the fact that when the hand is dipped in very cold or in very hot water we have an intense sensation of being touched which distinctly precedes the feeling of pain. This comparative slowness of the evolution of pain is noticeable in various forms of strong excitation of the skin. And Schiff, finding that animals, after section of the gray matter of the spinal cord, cease to feel pain while still susceptible to touch, has concluded that the nerve-commotions necessary for the two travel by different paths to the brain. All these phenomena are, however, explicable on much better grounds than those which assume that the physiological conditions of pain and pleasure (even of the skin) are found in the excitement of *specific parts* of the peripheral nervous apparatus. The relative slowness of pain is probably due to the fact that a more diffusive excitation of nervous substance, both peripheral and central, is necessary for the production of pleasure-pains than of comparatively indifferent sensations. The explanation of the apparently different paths of reaching the brain is probably connected with the same fact. While nearly everything which we do know about the conditions of our pleasures and pains is opposed to the view which considers them as specific sensations. Indeed, if the susceptibility of the areas of the skin *is* different for painful feelings and for sensations of temperature and touch, this may be held to be another proof of the heterogeneity of the neural processes which underlie feeling and sensations in general.

§ 3. Every biological theory as to the physiological conditions of our pleasure-pains holds that, in some way, pleasure is significant of activities which are *beneficial*, and pain is significant of activities which are *harmful*, either to the total organism of the individual or to the species or to the particular organ primarily involved. This conclusion, which modern science claims to arrive at inductively, is essentially the same as that which was assumed, in deference to teleological considerations, centuries ago. Aristotle, for example, conceived of pleasure as linked with every normal and natural activity; pain is therefore, as the opposite of pleasure, "negative" of what is abnormal, unnatural, injurious. From the same *a priori* point of view a modern writer[1] declares: "Pleasure is the positive feeling of a thing which accords with our nature, as pain is the negative feeling of an object which is contrary to our essence."

The modern biological view explains the physiological conditions of many of our pleasure-pains; but its failure at various points is only too evident. In view of the fact that some human organisms endure for years

[1] Tiberghien: Science de l'Âme, p. 488 f.

such a load of diffused discomfort and concentrated pains, with a constant accompaniment of depressed vital action, while so many others succumb, with relatively little painful warning, to long-continued "indulgence in pleasures," as well as in view of many other facts, to be considered later on, the task before biology is not small. One form of this theory (so Bain) connects "states of pleasure with an increase and states of pain with an abatement of some, or all, of the vital functions." But this statement summarizes only a part of the phenomena of pleasure-pain. For "an abatement of vital function" is sometimes accompanied by the pleasures of quiet repose, etc.; and pain is sometimes even indicative of an increase of vital function. Grant Allen,[1] after objecting to Bain's view as "too vague," declares that "pleasure is the concomitant of the healthy action of any or all of the organs or members supplied with afferent cerebro-spinal nerves, to an extent not exceeding the ordinary powers of reparation possessed by the system." But this statement is scarcely less vague than the one it is intended to displace. A similar conclusion is much better stated by a French writer, M. Payot.[2] This writer maintains that on occasion of the reaction of the nervous system to any external impression, either the increased forces called for by the elevation of vital energy suffice to furnish the required reaction, or they do not: in the former case we have pleasure, and in the latter pain. This relation varies with age, health, nutrition, etc. Here we come very close to the conclusion of another writer,[3] who thinks that the "sensation of pleasure" resolves itself into the "sensation of power," and the "sensation of displeasure" is to be identified with the "sensation of powerlessness." And this again reminds us of the "sthenic" and "asthenic" emotions spoken of by Kant.

But aside from the purely conjectural character of this view, and from the truth that it explains at best only our sensuous pains and pleasures, we find all the foregoing statements inconsistent with certain observed facts. Does the slight bitter, which most healthy persons find disagreeable, make a larger demand upon the "powers of reparation" (the forces called for by the elevation of vital energy) than the pleasurable indulgence, for example, of certain appetites? And what great change in these powers of reparation takes place during the forty-eight hours in which a normal cerebro-spinal system learns to receive with approbation the originally distasteful sensations produced by eating olives? A more careful adjustment to the facts has therefore resulted in such forms of statement as the following, taken from Lotze:[4] "Feeling (that is, as pleasure and pain) is only the measure of the partial and momentary accord between the effect of the stimulus and the conditions of vital activity." And now, if we restrict the "conditions of vital activity" to those which belong to the very organ, or part of the organ, to which the stimulus is applied, we have the biological principle stated in its most highly elaborate form. Doubtless, stimulation which is out of accord with the immediate conditions of vital activity in the organ stimulated is usually painful; stimulation which is not so out of accord may be expected to result in pleasurable sensations. And still the theory is not wholly satisfactory: for (1) there is no proof that many slight and yet dis-

[1] Physiological Æsthetics, p. 21.
[2] Féré: Sensation et Mouvement, p. 129.
[3] Rev. Philosoph., 1890, p. 497.
[4] Medicin. Psychologie, p. 298 f.

agreeable intensities of certain stimuli are harmful, except the conjecture which the theory supports; (2) the theory neglects too largely those central conditions in which (rather than in conditions of the organs exposed to the stimulus) the very nature of our pleasure-pains have their physical basis; and (3) it leaves quite unexplained the large field of our non-sensuous pleasure-pains.

Many facts are explained when we consider the Relation between Intensity of excitement and the accompanying Tones of Feeling. Physiologically considered, all the cerebral processes concerned in our sensations and ideas, when increased in amount beyond certain limits, become occasions of painful feeling. When, on the other hand, these processes are lacking in sufficient intensity to lay the appropriate basis, as it were, for clearly defined sensation or ideation, they may also be occasions of another kind of painful feeling. Hence we have pains of over-tension, strain, excitement, which, in extreme form, may appear to overwhelm consciousness in a sea of pain, or crush it under a load of anguish; but we have also the pains of uncertain, wavering, and excessively feeble sensation and ideation. *How much intensity of neural processes can be "borne" without pain, or even enjoyed, varies with an indefinite number of considerations resolvable into the constitution, habit, present condition, and "occupation" of the cerebral centers.* How much intensity these centers are actually called upon to bear depends, in part, upon the constitution and condition of the end-organs to which the stimulus is applied. These end-organs may be relatively unexcitable or hyperæsthetic (as in cases of morbid sensibility, either constitutional or due to disease). The same stimulus applied to the same organ, under different conditions of excitability, may thus be the occasion of very different amounts of that "semi-chaotic surplus" in which the cerebral processes of feeling consist. While, within the cerebral centers themselves, the limits of neural activity, the excess of which in amount is productive of pain, vary greatly for different individuals, ages, cerebral conditions, etc.

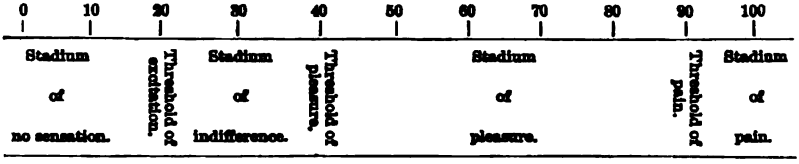
Psychologically expressed, the corresponding truth may be stated somewhat as follows: There is a certain amount of psychical activity, whether as expressed in sensation or ideation and thought, which is pleasurable, or at least not productive of pain. More than this becomes increasingly painful as the amount of sensation or ideation increases. Too strong sensations hurt; too vivid mental images are likely to be disagreeable; too intense thinking is unpleasant—even apart, it would seem, from those sensations of muscular strain and bodily pains in the head which

are apt to result. Very strong feelings, even feelings of joyful emotion and high sentiment, tend toward pain—somewhat as too much heat and too much cold produce scarcely distinguishable painful sensations. But, on the other hand, we feel more or less of painful repugnance toward those weak sensations and pale fragmentary ideas which seem not clear and decided enough to assert their place in the flowing stream of consciousness. Just as nothing is more hateful and tantalizing than those "half-baked" memory-images which ever elicit, but, by dissolving, elude our attempts at a firmer mental grasp. In these cases, however, we note that the pain is largely *relative* to our purposeful intention clearly to apperceive the sensation-complexes or to recall the mental images.

From the very nature of the case, the relation between our pleasure-pains and the intensity of the processes of sensation and ideation which they accompany cannot be definitely formulated. By experiment it may be shown, however, that this relation is not the same for our sensations as that which prevails between changes in the intensity of the sensations and changes in the intensity of the stimuli. In other words, *the varying amounts of our pleasure-pains do not stand to the varying amounts of our sensations as the varying amounts of the latter stand to the varying amounts of the stimuli.* The former relation is much more indefinite and complex than the latter. This fact accords both with the more complex cerebral basis on which our pleasure-pains rest, and also with the larger number of psychical conditions on which they depend.

§ 4. Nothing about the conditions of our sensuous pleasures and pains is more certain than that they depend upon the intensity of the processes which occasion them or which they accompany. This fact we may test by numberless experiments; indeed, life itself is one long testing of the fact. "Nothing in excess," if you do not wish to suffer for it, not even the most refined pleasures of art and religion, and, *a fortiori*, the pleasures of appetite, is the one rule for a prudent life. One may even take pleasure in feeling the edge of a razor if one does not press it too hard; and too much honey is more disagreeable than a weak solution of quinine. Indeed, experiment with sensuous feelings discovers at what grade of the intensity of the sensations the tone of the feelings changes from pleasure to pain, or the reverse. If the skin is gently stroked, or the eyes filled with a moderate intensity of colored light, or the ears stimulated by a not too loud tone, the sensations are not painful. By increasing their intensity they become more pleasurable up to a certain point. But by increasing the intensity still further, a painful tone of feeling is made to emerge; and, by sufficient application of force, the pain accompanying some of our sensations may be made almost wholly to submerge the objective character of the sensations themselves.

Beaunis[1] has represented the dependence of our pleasure-pains upon the intensity of our sensations, in the four stadia which he recognizes, by the following scheme (the figures at the head represent the increasing amounts of the sensations):



[According to this author, not only may the extent of these stadia and the moment of their appearance vary greatly, but with some substances the stadium of indifference is lacking, or the stadium of pleasure much abbreviated. Beaunis is led to the conclusion that all the sensations, even those most apparently simple, involve elements both pleasurable and painful.]

How both the intensity of the sensations, in dependence upon the intensities of the stimuli, and the intensity of the resulting pleasures or pains, in dependence on the intensities of the sensations, may be subject to variation, and yet not according to the same law, is illustrated by the following diagram.[2] Here *E min.* and *E max.* represent the minimum and the maximum intensities of stimulation; and the abscissa-line between them represents the division between pain (whose curve is below) and pleasure (whose curve is above). The continuous line represents the relation of intensity of sensation to intensity of stimulation. The dotted curve represents the pleasure-pain series, both above and below the abscissa-line.

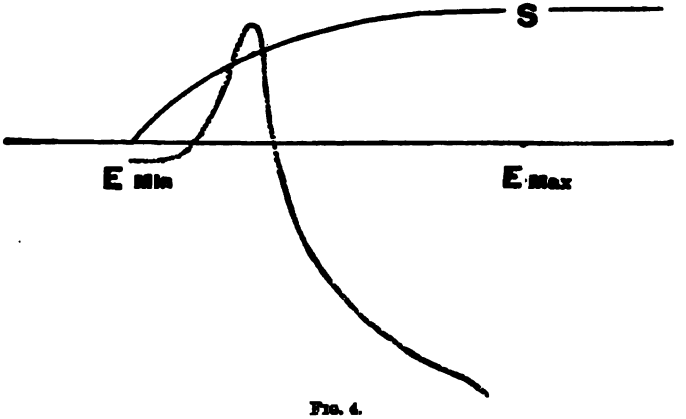


FIG. 4.

An ingenious conjecture of Wundt maintains that the maximum point of pleasure for any sensation lies about what he calls the "cardinal value" of the sensation, *i.e.*, the place where the sensation ceases to increase in simple proportion to the strength of the stimulus. This is the place where the sen-

[1] See Sensations Internes, etc., p. 243 f.

[2] Adapted from Ziehen: Introduction to the Study of Physiol. Psychology, p. 181.

sation is most "valuable" for purposes of clear perception. It would seem, then, that our sensuous pleasure-pains are, in a measure, *relative* to the amount of cognition we get through the sensation. We have already remarked how *the failure of weak and flickering sensations to prove of value in securing cognition is, in part, the occasion of the pain which accompanies them.*

Very great Differences are to be noted in the Intensities of which the pleasure-pains connected with the different Classes of Feelings are capable. These differences are either natural (such as belong to certain classes of sensations and ideas for all men), or constitutional (such as belong to the peculiar temperament of the individual), or acquired (such as fall under the principle of habit, etc.). But besides these differences, which can all in some sort be reckoned with, there are others which are so variable and capricious as quite to elude all efforts to reduce them to law. Among the different classes of sensuous pleasure-pains a great natural difference exists as to the intensity of which they seem capable; and in a somewhat modified meaning we may make the same statement of the different classes of ideas. Certain feelings of relation, for example—whether occasioned by changes in the processes of sensation or of ideation—are generally disagreeable; but by disposition and inheritance different individuals differ greatly as to the amounts of pleasure and pain which the same classes of sensations or ideas occasion. It is also true of all men that the amount of sensuous or intellectual activity which they can "bear" at any particular time differs greatly; and how pleasurable or painful any particular amount of activity will be depends upon a rather incalculable variety of concomitant conditions.

In general, ideal pleasures and pains, when measured by a strict standard of quantity, are much inferior to those occasioned by strong sensations. We enact a fiction which is convenient for practical uses, but which is far from representing a psychological truth, when we regard these ideal pleasure-pains as more or less determinative of the choices of the individual, *because* of the estimate put upon them with respect *simply* to their position in a scale of intensity. Ideal pleasures and pains are confessedly, as a rule, not accompanied by such great disturbance of the nervous system as are bodily pleasures and pains. But it will appear more and more clearly that the development of the individual, even in the lower ranges of life, as estimated by intellectual, æsthetical, and ethical standards, takes place on other conditions, and is influenced by other considerations than those determined by *quanta* of pleasure-pains. This is true even of the lower animals, which, under the influence of feelings and

ideas that we denominate "instinctive," or following blind impulse, reject pleasures and accept pains in the pursuit of ideal ends. And of man it is emphatically true that the very beginnings of his psychical development are conditioned upon his *not* being unduly influenced by considerations derived from the relative intensities of his pleasure-pains. Pleasure and pain are undoubtedly powerful as spur, and bridle, and bait, in the struggle for existence. But whatever biology and certain doctrines of political economy may see fit to hold on this subject, psychology cannot find that the facts testify to this side of life as being by any means all-powerful. Indeed, *all human life develops largely by relegating the immediate effects of our activity, as respects the quantities of pleasure or pain evoked, more and more to the background.*

§ 5. The marked difference among the different classes of sensations, as respects the amounts of pleasure and pain which can accompany them, is expressed in the popular language. Psychology is obliged to adopt the term "pleasure-pain" to include all degrees of the two tones of feeling, from the intensest bodily anguish or ecstasy of pleasurable excitement to the faintest agreeable or disagreeable memory-image. But by bodily *pain* the people understand something sharp and decisive in its impression on consciousness, for the most part due to intra-organic or to skin sensations. The more intensely disagreeable feelings of grief, disappointed love, and wounded pride, shame, or regret, they also speak of as "pains." It is difficult, however, to get the ordinary man to admit that when the quality of his food, or his tobacco, or the color of his wife's dress, does not quite "suit him," he is suffering "pain." Psychology, by its use of the terms, properly marks the sameness of *quale* which goes with such a variety of *quanta* in the entire "pleasure-pain" series. But the popular language emphasizes two important psychological truths: (1) the dependence of a distinctly marked tone of feeling upon the intensity of the processes which occasion the feeling; and (2) the fact that both pleasurable and painful tones of feeling are relatively disregarded in the pursuit of ideal ends.

According to Lotze,[1] feelings of sense are, "in the case of the different senses, so much the more intensive the less these senses are capable of fine objective perceptions. Colors and their contrasts merely excite satisfaction or dissatisfaction; dissonances of tones cause suffering to the hearer personally; the pleasure and pain of smell and taste are much more intensive: but it is only in the skin, which of itself alone furnishes little cognition, and in the interior parts, which contribute to cognition nothing whatever, that the pain assumes the character of physical suffering. The purposeful nature of this arrangement is manifest; its mechanical basis is unknown." This statement, so far as the plain fact of variation in intensity is concerned, is true; but the explanation given is not wholly satisfactory. With the important exception of the skin, the organs of sense which furnish most objective in-

[1] See Outlines of Psychology, p. 75 f.

formation are, indeed, least subject to be the occasions of intense pleasures or pains. Biology and psychology enable us to see, in some measure, both why it *is* so, and why it *should be* so. The nature and the development of sight forbid that seeing disagreeable colors or ugly shapes should occasion such pain as cutting, pinching, or burning the skin or entrails can cause. The intensity of the stimulus which reaches the visual nerves is modified by closing the eyelids and contracting the pupils and by the photo-chemical changes which intervene between the light-wave and the optic-nerve. Indeed, it is doubtful whether any pains and pleasures of the eye that are not ideal are due to excessive stimulation of the same nerve as that which gives sensory impulses of color and light. This nerve can be destroyed by heat—for example, on looking for a long time too closely upon a great fire —without pain being felt. The sensuous pains and pleasures of the eye may then be considered as belonging to touch. The pains and pleasures of tones, tastes, and smells, although still immediately sensuous, are becoming, as development goes on, more and more matters of determination according to ideal standards. The ear of the Greeks scarcely tolerated as agreeable the "imperfect consonances" of the Major and Minor Third. But Handel accepted "Fourths," Beethoven "Fifths," and the modern Wagnerian music pleases many lovers of music, although tolerating the widest range of discords. Some nations, whose music is quite undeveloped (notably, for example, the Japanese), find intervals agreeable which are intolerable to us—apparently because of the association of the tones with the sad, weird sounds of nature, so "consonant" with the national tone of feeling. Tastes and smells are now, for the civilized man, no longer a prominent means of objective information necessary to his "survival," but are rather of the nature of æsthetical superfluities; and, in the realm of feeling, the steadiness of adherence to a standard and to a fixed place in the pleasure-pain series is thus necessarily forfeited.

Biology attempts to account for the hideous "bulk" of our painful skin-sensations in accordance with the principles of evolution. In those lower, perhaps "ancestral worm-like," forms to which the evolutionary biologist refers and from which he conjectures that man sprung, we are told that strong and prompt painful reaction to such sensations would develop on account of their beneficial tendency to discontinue or inhibit baneful contact. This explanation would be more applicable if it were the intention of nature, not to preserve the worm, but to punish it with severest pain, in the very act of being burned, swallowed, or crushed. For strong, painful sensations generally arise too late to serve as an effective warning; they are confusing rather than helpful to objective information and purposeful action; and, as a matter of fact, it is by delicate, painless, objective tactile apparatus (feelers, antennæ, etc.) that the lower animals are made capable of preserving themselves and of propagating their kind. Thus this teleology of biology is as unsatisfactory in fact as it is in ethical theory.

§ 6. That, within certain rather wide limits, individuals differ largely as to the estimates they put upon the *quanta* of pleasure and pain occasioned by different classes of sensations and ideas, all our experience teaches us to recognize. "There is no accounting for tastes," and "concerning tastes there should be no dispute." This is partly due to the fact that different

persons *do* actually suffer or enjoy under very different conditions. Some—as we truly say—are "not capable" of suffering as others are; and every one is more capable, relatively (we might add), of some kinds of suffering than of others. On the other hand, psychology must not overlook the effect of ideal aims, not only upon the estimate which different men give to amounts of pleasure or pain, but also, and chiefly, upon the important fact whether they are greatly "influenced" (not to say "governed") by any merely quantitative estimate. So far as *mere amount* of pain is concerned, all men may readily enough agree with Heine: "Psychical pain is more easily borne than physical; and if I had my choice between a bad conscience and a bad tooth, I should choose the former." The fact here reckoned with is undoubted: *ideal pains and pleasures are not comparable in mere intensity with sensuous pains and pleasures.* The same fact is assumed in the cynical maxim: "The chief conditions of happiness are good digestion and no conscience."

We are obliged, then, to confess that neither the existence nor the purpose of the definite amounts of pain and pleasure connected with certain activities of body and mind can be satisfactorily explained by psychology. In general, however, when the intensity of that unorganizable surplus of nervous excitement, that overflowing commotion of the nervous centers which is the physical basis of feeling, surpasses certain variable limits, pain is the result. It is, perhaps, because the ideal feelings are usually supported by less of this "semi-chaotic surplus," that they are less intense. On the other hand, strong and lasting feelings which start in an ideal way (the emotions of rage, joy, fear, revenge, chagrin, grief, etc.) profoundly affect the physical basis of life; and they thus take on a tone of pain or pleasure, as respects quantity, comparable to sensations. But the physiological principles which control here are very complicated; we do not as yet know them thoroughly. And for any adequate notion as to the significance of pleasure and pain, and of the distribution of their amounts among the different bodily and psychical states, we must look to ideal ends that lie outside of the mere facts of feeling in themselves considered.

§ 7. That certain "feelings of relation" are naturally painful, we have already had repeated occasion to remark. Among such, in their simpler forms, are the feelings of too great surprise, of monotony, of tedium, of excitement and confusion from too great rapidity of the mental movement, etc. Peculiarly acute is the painful feeling induced by the stimulation of sensation-complexes that *interrupt* the smooth flowing of the current of consciousness when it is full and strongly set in a definite direction. When we are giving a large amount of discriminating attention to any particular connected train of sensations or ideas, the cerebral and psychical disturbance occasioned by sensations and ideas that do not "train with" those which already absorb us, is out of all proportion to the intensities of the stimuli involved. For example, if one is listening to a series of sounds, or looking intently at some object, the feeling of "distraction" caused by being spoken to in a whisper or lightly touched amounts to a sharp physical pain; it may arouse, in turn, the most intense irritation and anger. This feeling is, in part, the base of that resentment which most men experience at being interrupted in speech or at having their opinions denied. The whole

Herbartian doctrine on this subject amounts to little more than this: the smooth running of our mental life—the flow of sensations and ideas *related* so as to serve the ideal aim of apperception—is pleasurable.[1] Here we may refer again to the connection of these pleasure-pains of related sensation- and ideation-processes with the distribution of attention. To quote from Dr. Ward: "There is pleasure in proportion as a maximum of attention is effectively exercised, and pain in proportion as such effective attention is frustrated by distractions, shocks, or incomplete and faulty adaptations, or fails of exercise, owing to the narrowness of the field of consciousness and the slowness and smallness of its changes." Physiologically considered, we see again how the kind and amount of the stimulation, or the place of its application (to conjectural "pain-nerves" or "pleasure-nerves"), has in many cases little to do with the resulting amounts of pleasurable or painful feeling; *the way the stimulation fits in with the existing cerebral conditions, and the amount of "disturbance" it occasions in the cerebral centers, is the chief determining cause of sensuous pleasure or pain.* These facts accord with the view already presented of the nature and conditions of all feeling.

Activity of the nervous system and the correlated mental states within the limits of intensity which, for want of accurate knowledge and precise formulas, we may call "Normal," is regularly pleasurable. Certain facts, however, do not correspond with this rule. There seem to be sensations and ideating processes which must be considered "natural," because they belong to all mental life, that are accompanied by painful feeling, whatever be the degree of intensity they attain or the condition in which they find the subject when they arise in consciousness. Psychology, which considers primarily the phenomena of the individual consciousness, as such, must then acknowledge the existence of "naturally" painful sensations and ideas.

On the other hand, excitements of feeling, whose intensity reaches beyond the limit of safety to the organs, and whose ethical character is pronounced against by an enlightened conscience, are not infrequently accompanied by a predominating tone of pleasure. That which we discover, by inference from remote and indirect consequences, to be "bad" for the organism or morally indefensible, is by no means necessarily disagreeable. Indeed, complex emotions of every character, unless certain sensuous factors become too predominating and intense (and this is ordinarily the case only in weak or diseased persons) are, on the whole, pleasurable. The statement is as true, though not in the same way, of anger, resentment, and vengeance, or of pride, excessive self-feeling and self-approbation, as of the finer and

[1] Something like this truth is expressed by one writer as follows: In sensation the soul's condition changes, and it must *sense* the changes ("Sie muss empfinden dass sie empfindet"). This "self-sensing" of the soul is no longer mere sensation: but it is *feeling* ("Das Innewerden dieses eigenen Seelenzustandes ist und heisst Fühlen"). Ruegg: Lehrbuch d. Psychologie, p. 25.

more altruistic forms of emotion and sentiment. Hatred and love, the feeling of self-importance and the feeling accompanying the appreciation of others, are by no means necessarily opposites when arranged in the scale of pleasure-pains.

Differing degrees of both pleasure and pain may attach themselves to the different factors which enter into all the more complex forms of emotion and sentiment. To state the matter in an abstract way, *all elaborate emotions and sentiments generally furnish some reasons why their tone should be one of pleasure, and other reasons why their tone should be one of pain.* They are mixed in tone. But one of these two opposite tones is likely to be predominant, and to give the characteristic to the entire complex experience. The two opposite tones, as represented by the factors which have them, may struggle together, as it were, for supremacy in the total affective complex; they may find it impossible to fuse. The emotion or sentiment then assumes that peculiar condition of vacillation between predominating pleasure modified by pain, and predominating pain modified by pleasure, with which all are familiar. This entire class of experiences justifies us in saying—as a general rule, which, however, admits of certain marked exceptions—that excitement of sensibility, as such, tends to be pleasurable up to the limit where painful bodily feelings, due to excessive strain or tension, or else disagreeable æsthetical or ethical sentiments, are aroused and maintained. In the majority of cases of strong emotions and sentiments of whatever character, the rush and onward sweep of feeling, with its tone of pleasure due to the fact that both cerebral and psychical excitement is at a high pitch of intensity, for a time overwhelms all painful factors, whether of a sensuous, æsthetical, or ethical order. The answer to the question: "Doest thou well to be angry?" as sincerely given by the subject of the emotion, regularly comes (so long as the anger is in full sweep): "I do well to be angry, even unto death."

§ 8. We seem compelled to admit the existence of "absolutely" unpleasant sensations (*i.e.*, sensations that are disagreeable, irrespective of their intensity). This is, at any rate, true, so far as strictly psychological analysis and explanation can go. Thus M. Beaunis[1] holds that certain odors, savors, sounds, and feelings are, *qualitatively considered*, always disagreeable. The behavior of infants, on awakening to the life of sensation in its various forms, would seem to indicate this. The liking for bitter tastes, for a considerable number of odors, for discordant and grating sounds, and perhaps for sensations of contact that have become associated in the experience of the race with disgusting or harmful objects—slimy worms, *e.g.*—if

[1] Les Sensations Internes, p. 209 f.

attained at all, must be cultivated under the influence of favorable association.

That many of the most primitive forms of those feelings which have been called "feelings of relation" are disagreeable, irrespective of intensity, has already been pointed out.

§ 9. In spite of the phenomena of "naturally" disagreeable feelings of a sensational or ideational stamp, we may maintain the general but not universal principle that excitement of sensibility, as such, is agreeable. The distinction between the opposite classes of intellectual, æsthetical, and ethical feelings is not closely connected, even in the most primary and elemental forms of the arousement of sensibility, with the pleasure-pain series. A careful analysis of any of the leading forms of emotion will show the truth of this statement. Anger, for example, is, in a large majority of instances, *per se*, a pleasurable emotion. It is only when the factors of painful feeling, arising from intense bodily excitement or introduced on grounds of habitually observed æsthetical or ethical considerations, become obtrusive as factors that the complex emotion changes tone and becomes disagreeable to the subject of it. Most men who have not "weak" hearts or "tender" consciences (and most men are *not* afflicted or endowed with these hindrances to pleasure) enjoy being angry. When the emotion has subsided, the arousement of sensibility in connection with reflection upon the past emotion—its æsthetical and ethical character, its consequences, etc.—is quite another affair. Even in the midst of the passion, the painful feeling of constriction about the heart, of laboring respiration, of the dangerous rush of blood to the head, may modify the whole emotion, or change it to the opposite tone of pain. Even in the midst of it the "voice of conscience," or the feeling of "good taste" —as we say—may give a more or less disagreeable tinge to our indulgence of this passion. But generally there can be little doubt, for the time being, the emotion of anger is, on the whole, a somewhat highly agreeable emotion.

In the so-called "natural" man—that is, the man previous to the modification of his conduct and feelings under the influence of ideal aims—the passion of vengeance, whether as exercised in the pursuit or in the punishment of the object toward which it is directed, is a pleasurable feeling. The savage or the child chases his enemy in flight, and thrusts him through with a spear or beats him with a stick, in a sort of ecstasy of joy. The conflicting emotions, with their characteristic pleasure-pains, which are called forth in all kinds of struggle and contest (on the field of battle, in the prize-ring, etc.), are, on the whole, predominatingly agreeable. Both victor and vanquished, as a rule, share in the pleasurable excitement of feeling which the struggle involves: the former has added to this the pleasures of superior strength and skill belonging to his triumph; even the latter, so long as the contest lasts, is probably in a predominating state of happiness. It is only when the emotional phases of feeling are past, and the influence of the more reflective phases, together with the revulsions of feeling ordinarily involved in them, become prevalent, that consciousness is suffused with a decidedly painful tone of feeling.

Connected with this principle is the explanation of many of those more startling exhibitions of cruelty which the history of crime, and even careful

observation of the daily conduct of children and of "unidealized" human life generally, so abundantly reveal. The Indian who *enjoys* the torture of his captive enemy, the "moral monster" who is proud to have "laughed with glee" at the pains of his innocent victim, the child who takes what we are accustomed to regard as a "strange delight" in pulling off the wings of insects or in pinching the tail of a pet animal, are alike "natural" and "unnatural" in such behavior. Their actions may indeed be influenced by a variety of motives and accompanied by a variety of more or less conflicting emotions. The total result of the fusion will be different in different cases. But at the base of all these cases lies the principle that, *in strong excitement of feeling of every kind, while the emotional stage endures, the normal tone is one of pleasure in the excitement.* So far forth Aristotle's conception—"The feeling of pleasure is linked with every natural and normal activity of mental life"—is an understatement of the truth. Even in the case of bodily pleasure-pains, it generally implies the æsthetical development of the adult to find:

> "A surfeit of the sweetest things
> The deepest loathing to the stomach brings."

All feelings, as such, but especially as "Pleasure-pains," are subject to the laws of Rhythm and Repetition. The ground for both of these laws is found in the most fundamental conditions of the life and activity of the nervous system itself. We have already seen that pleasurable and painful feelings depend largely upon those changes of vital condition and action which take place in the nervous end-organs as related to intensities of stimuli, but, more especially, in the cerebral organs which receive and modify the nerve-commotions excited by these stimuli. Both repetition and rhythm have much to do with such vital condition and action. The energy of the nervous system is limited: it is exhausted by too frequent demands made upon it, especially to energize in the same way within the same nervous centers; it is somewhat rhythmically repaired, and then again exhausted. The intermittent character of the simplest and most primary pleasures and pains is apparent in the behavior of the infant; it is illustrated by our experience throughout all adult life. Connected with this we find the tendency to pass quickly, and perhaps with an uncontrollable impulse, from one form of emotion to its opposite. "That extremes meet," says Höffding, "is nowhere better exemplified than in the life of feeling, where the sharpest and most important contrasts are indigenous." In spite of the tendency of so-called "disposition" and of habit, to give steadiness to the life of emotion and sentiment, and in spite of all the equipment and skill which the most highly elaborate civilization and the most careful education provide, pleasure and pain continue to characterize all human life as the accompani-

ments of the most various forms of feeling. The "laughter amid tears," which Homer describes in Andromache, becomes more descriptive of all complex affective phenomena as the development of the individual and of the race goes on. Simple, unmixed, and frequently repeated similar pleasures or pains belong to the relatively naïve and childish stages of evolution. How all modern art, especially music and the drama, illustrates this truth, will appear more clearly later on.

In its effect upon the life of mind, considered as so-called intellect and will, repetition seems subject to laws which admit of a tolerably definite determination. In reaction-time, as influenced by fatigue and by habit, we have means for examining experimentally, within certain limits, this effect. The effect of repetition upon our elementary bodily pleasures and pains may be examined in the same way; but the examination does not yield equally satisfactory results. In trying to deal with the influence of repetition upon all the higher and more complex forms of feeling, we speedily become lost in the intricacies of our problem. Here each individual appears to be a law to himself.

In general, however, the effect of repetition upon feeling differs, in important particulars, from its effect upon intellection and volition. "Mind" and "will"—in the narrower meanings of these terms—can be trained, by being made to repeat the functions belonging to them as faculties, in an orderly and calculable way. Feeling also is subject to control and modification through its dependence upon the functions of intellection and volition. But the immediate effect of repetition upon affective phenomena is by no means calculable. Such a difference is partly due to the differing effect of attention in the two classes of cases. By repeated discriminating attention our sensations and ideas, as respects their objective reference, are made clearer and stronger; fatigue becomes less, and the chances of a revulsion, or breaking away from habit, are diminished. But such attention itself tends to destroy, or greatly to modify, many of our most characteristic feelings with their tone of pleasure or of pain. The exhausting character of the emotions, as such, also influences the effect of repetition; a frequent indulgence, or a second indulgence coming too soon after a first indulgence of any passion or sentiment, is apt to have a painful tone; it is apt also to be followed by revulsion to an opposite phase of the affective life. The necessity of reckoning with this freaky and changeful character of the feelings occasions much uncertainty and difficulty for education, for economic and social measures, and for all our dealings with one another and with ourselves as psychical beings. Were it

not for *feeling*, we could talk more confidently of "laws" of all psychical life; we could judge more exactly when similar states of such life would recur, and what would be the gross effect of repeating similar forms of stimuli, and of securing recurrent like conditions of environment.

§ 10. *Oscillation* between bodily pleasures and pains, obscurely connected with unlocalized and uninterpreted sensations, is probably characteristic of the earliest psychical life of the infant. The affective element or aspect of consciousness (the "state of being" in which the subject *is*) undoubtedly is at first far more absorbing of psychic energy, as it were, than the intellectually discriminated objective aspect (the sensation which the subject *has*). Judging by all the signs, the two tones of pleasure and pain belong to the earliest experience in every case. In being born, and bathed, and subjected to all the first assaults of nature upon its various end-organs of sense, as well as in learning to digest its food, to use its limbs, to gratify or express its wants, etc., the child is kept alternating between pleasure and pain. It is, indeed, out of these primitive pleasure-pains, by influence from associated sensations and ideas, that the later more complex life of feeling is developed. [For example, anger develops through aversion to objects which are connected with painful sensations; affection for the nurse or mother is cradled in the pleasure due to warmth of the protecting arms or to the softness of the cheek or breast while held in contact. Impulses and desires are evolved in variety as the associations of pleasure-pains with different activities and ends become differentiated.]

Feelings are not only recurrent, like all other psychic phenomena, because they occur in *time-form;* but they are also especially subject to peculiar forms of rhythmic change. In the case of those "mixed" feelings, where agreeable and disagreeable factors are both present, the action of discriminating attention may result in an oscillation between pleasure and pain. This experience is had in an interesting way when we are trying to determine whether we *like* a certain sensation-complex of color, taste, smell, sound, etc., or not. Feelings of comfort or discomfort often recur in a somewhat rhythmic way; or feeling may alternate between its two opposite tones in dependence on recurrent sensations or ideas. This is particularly marked in respect of some of the various forms of vital feeling. The periodic vital action of the nerves also manifests itself in periodic changes in the intensity of feeling. None of our pleasure-pains remain at a perfectly uniform tension, as it were. They rise and fall in a more or less rhythmic way, with (at least) what has been called "an irregular periodicity." This alternate swing of the pendulum may carry the tone of affective consciousness back and forth over the line of indifference; feeling is then agreeable in one instant and disagreeable the next. The relative cessation of severe pains may be felt as pleasure in a state where, by still longer continuance, the same bodily or psychic processes become again the occasion of pain. One may even be pleased with one's toothache just now, if it is much less acute than it was an instant ago; but to have it continue without further change would be not only uninteresting and monotonous, but unbearable pain.

More interesting still, psychologically considered, are those alternations of feeling in which the passage is made from one complex sentiment or emotion, with its characteristic tone of pleasure or pain, to the so-called opposite sentiment or emotion. The liability to this in many forms of strong feeling is recognized both in polite literature and in popular maxims. Hence the exhortations of poets and moralists not to love too violently, lest hate or at least distaste should follow; not to hope beyond measure, if we would not fall over into dread or despair; not to enjoy anything in excess, unless we are willing to find it particularly loathsome thereby; not to revere and admire immoderately, for fear of coming unjustly to contemn and despise. In this respect all experience teaches us how much more steadfast and trustworthy (calculable) are some dispositions than others. Yet the general and time-honored impression, that no one can "sustain" any one form of emotion or sentiment without risking a movement toward its opposite, is founded upon a vast amount of experience. The physiological basis for this kind of alternation in the life of feeling is obscure. Only in a very limited way can we claim that the nervous system is "rested" after exhaustion by one emotion with excitement in the opposite way; for apparently all strong emotions alike involve an exhausting excitement of the same nervous centers. It may be said, however, that this general condition of great excitability, this hyper-agitation of the neural elements, which strong feeling requires, is a preparation for its own continuance. Any small change in the character of the stimulus finds the whole body of neural material in an explosive condition. But here the psychological explanation is much more obvious and satisfactory. The love of variety, the dislike of monotony (and so the pleasure which new emotional excitement of any kind tends to produce), the influence of intellectual, æsthetical, and ethical considerations (which are either designedly or unexpectedly evoked to "turn the tide," as we say), account for much of our experience here. But, after all, it seems necessary to admit a sort of unexplained and "natural" tendency of all forms of feeling, especially when somewhat strongly aroused, to pass over into their opposite. The principle of "rhythmic movement" is, then, one of a very extended although somewhat uncertain application.

§ 11. Besides the naturally rhythmic character of the occurrence of all feelings, with their tone of pleasure or pain, it should be noted that certain characteristic *pleasures* belong to the consciousness *of rhythm* itself. Periodically recurrent agreeable sensations and ideas have their pleasurable tone heightened by the feeling of their periodicity; slight pains, and even to some extent pains of great intensity, are made less disagreeable if they are felt rhythmically. Such pleasures of rhythm are particularly noticeable in the exercise of the muscles and in the excitement of skin-sensations—with the quickening of circulation, and the grasp, loosening, and renewed grasp of attention upon the sensations and ideas occasioned by these bodily processes. The pleasures of dancing, marching, swaying the body or moving any of its members rhythmically to and fro, are largely of this order. The singing of children as they trip along, the periodic musical grunting of sailors as they lift anchor, the mark-time of the coolies, or the pleasant wailing of the workmen as they drive piles, or handle timbers, in Japan, not only serve to guide the rhythm of movement and lighten the burden of the individual,

but also to express the satisfaction which the rhythmic movement itself occasions. The pains of muscular fatigue, abraded skin, and wearied organs of sense are lightened or even submerged by these pleasures of rhythm. The agreeable feelings produced by hearing the reading of poetry or the intoning of services in unknown languages, or by periodically recurrent natural sounds (that, taken singly, are not interesting), belong in the same class. Every listener feels the pleasure with which the periodic recurrence of the air is welcomed in certain species of musical composition. Akin to this is the agreeable feeling with which we regard regularly recurring figures in ornamentation as the eye meets them when sweeping over its easier lines of movement. Not even the pleasures of novelty, or the pains of monotony, can make us unaware of something not wholly to be approved of, when one or more unrhythmic numbers intervene in our rhythmic series. In the higher realms of ideation and of æsthetical approbation other considerations suppress, in large measure, these potent pleasures of rhythm; yet even in these realms their presence and power can generally be detected by a little careful analysis.

> "How sour sweet music is,
> When time is broke, and no proportion kept."

§ 12. It has already been said that the *effect of repetition* upon feeling, and upon its tone of pleasure or pain, does not follow the same laws as those which express our experience in the realm of cognition and will. Indeed, the very nature of our feelings as pleasure-pains is such that the use of the word "law" can be allowed only *cum grano salis* for the individual cases. Experiment in the psychological laboratory shows, for example, that while accommodation of the eye for perception from short to long distances improves quickly by practice, and retains through a long series of experiments the benefits of practice (in spite of increasing pain), the accompanying painful feeling caused by the repetition may grow in intensity until it becomes unbearable. Hypnotic subjects can repeat the volitions necessary to keep an arm rigidly held out for an incredibly long time: not because they have more muscular strength or so-called strength of will than normal persons, but because they do not feel the resulting pains. In general, the somewhat rapid repetition of bodily pains of moderate intensity causes a cumulative effect in unbearable anguish, rather than a softening of their intensity under the law of habit. This is doubtless due to the spreading of that "confusion" of the neural activities, over wider areas and with a growing intensity, in which the painful character of the physiological condition consists.

Repeated pleasurable sensations of a low degree of intensity often accumulate an agreeable tone by the repetition itself. In the pleasures of being gently stroked, of having the hair combed, of being soothed with humming bees or murmuring waters, of rolling sweet morsels under the tongue, or of being fanned with cooling breezes, this principle of "summation" of feeling coöperates with that of rhythmic movement. But "jerky, irregular successions" of weak and otherwise pleasant stimuli are very disagreeable.

On the other hand, feelings which have a strong tone of pleasure or pain are usually dulled by frequent repetition. Pleasurable feelings may thus become less and less pleasurable; and bodily and mental activities of an intense

character, which when occasionally exercised are highly pleasurable, may on repetition become painful. It is one of the recognized safeguards and reliefs of suffering humanity that the sensibility is dulled, and the subject rendered less impressible by the frequent recurrence of strong bodily or mental pains. This principle, which is sometimes spoken of as the "decay of feeling," under the influence of "accommodation" and habit is, however, far less simple and universal in its application than is generally supposed. It is doubtless based upon two physiological laws: (1) severe pain exhausts or devitalizes the nerve-centers and renders them less capable of strong reactions; (2) the nervous elements and the entire nervous system adjust or "accommodate" themselves to habitual forms of excitation, however painful and injurious such forms may be. But these very physiological laws recall our attention to the basic fact that "feeling" expresses the most individual essence of the neural and psychical life. It is *I*—without any objective reference whatever—*who suffer and enjoy;* my pleasures and my pains express for the time being, what state *I am in.*

In accordance with what has just been said, the effect of repetition upon feeling varies greatly in different persons, according to temperament, habits, and ideal aims. With some persons the same repeated sensations or ideas are, on account of the repetition, disagreeable, because they awaken feelings of monotony and painful craving of change; while new sensations and ideas (even those that, in themselves, are somewhat intensely disagreeable) because they are *new*, are invested with interest and felt as a pleasurable change. With others, however, nothing is more disagreeable than to be compelled to see, hear, smell, taste, touch, or think about anything which is not already quite familiar. The pleasure-pains of such are eminently conservative. Their pleasures are the mild pleasures bred of familiarity; their pains are chiefly the negative pains of "missing" some sensation or idea from their daily round. If others agree with Charles Lamb in highly estimating the pleasures of first landing in a foreigu country, they are more than content with the pleasures of always abiding in the ancestral home. To all music-lovers, in certain moods "the fascinating minor *monotonous* themes of the West Indian strains," which Gottschalk used to play, are more agreeable than are more varied themes.

It is only in the case of the more ideal feelings, the pleasure-pains of our higher intellectual, æsthetical, and ethical life, that the effect of repetition can be reckoned with somewhat accurately. It is here that we can most confidently employ repetition for the training of the affective field of consciousness. In repeating the more mild and complex pleasures of this kind we are more sure to acquire a "taste" for them. And here taste once acquired may develop into an absorbing passion, whose very nature is such that it permanently controls the entire disposition and conduct, and makes possible the welcome of frequently repeated affective phenomena of a high degree of intensity. The reverse of this process is that progressive triumph over the deterrent and enslaving power of pain which is brought about by the pursuit of ideal aims.

All our Feelings, with their tone of pleasure or pain, come under the two principles of Diffusion and Association. The

physiological preconditions of feeling are such that they tend to diffuse themselves more and more widely, as the stimulation which occasions them is continued. *Every state of predominatingly pleasurable or painful emotion tends to involve the whole area of the brain, and to influence a larger number of the outlying organs through the supreme control which this central organ has over all the bodily functions.* Even our intellectual and volitional processes are "felt" as having a reactionary influence on the organs of sense, and on those internal organs whose condition and functions determine so largely the basis of bodily feeling, of disposition, mood, etc.

In order to describe and explain the influence of "association" (in the more precise use of the word) upon feeling, it is first necessary to consider how, and how far, affective phenomena admit of being ideated; and what are the connections maintained between these phenomena and those of cognition and volition. This subject will be examined later on. But we now employ the term "association" in a vaguer, less correct, and yet indispensable way. Many of our apparently most fundamental pleasure-pains have become connected with sensations and ideas by processes of "fusion" or primary association. The connection has indeed become lost out of consciousness; it was, nevertheless, however "natural" it now appears, originally established by some particular associative activity. Thus, not a few tastes, smells, sounds, and skin-sensations, are immediately felt as pleasurable or painful, with various degrees of intensity (either lower or higher), because of some forgotten experience. The infant's taste for sweet, for example, may be largely acquired by connection with the mixed pleasures of being nursed on milk of a delicately saccharine flavor. We find certain simple curves and figures pleasant, or ugly, without recognition of the fact that this is due to the slightly agreeable or disagreeable muscular sensations evolved by mastering them with a moving point of regard. Long before we are capable of making our own pleasure-pains data of self-knowledge, these processes of diffusion and fusion have operated to complicate even the more primitive forms of conscious affective phenomena.

§ 13. The amount of wide-spreading feeling which some sensations of a low degree of intensity occasion is out of all proportion to their immediate excitatory effect. The nausea which follows certain slight disagreeable tastes and smells, the general depression which small disappointments or rebuttals often occasion, the effect on the whole tone of our experience wrought by aromatic flavors or by stimulation from ammonia or eau de cologne, the convulsions of mirth caused by tickling or by small bits of

grotesque imagery, etc., are instances of this truth. Such effects are doubtless due to what Mr. Sully[1] has called "organic consensus." But this phrase only expresses the general fact that the entire nervous mechanism acts as a unity of molecular mechanisms; it cannot suffer neural commotion in one part without being affected throughout. To this vague general statement it must be added that, since a "semi-chaotic surplusage" of neural excitation is characteristic of feeling, the rapid and wide diffusion of this kind of excitation is a resulting characteristic. A little pain or pleasure *felt*, "disturbs" the neural mechanism in a more expansive way than a large amount of sensation or ideation with no marked characteristic tone of feeling.

Strong emotions and passions, where the whole organism is robust and healthy, may even exercise a purgative and sanitary influence. Vigorous Martin Luther tells us of the physical benefit he received from sometimes "getting mad" to the very core of his being. The passions of love, ambition, devotion to art, etc., not infrequently raise to a higher condition of function all the neural and psychic energies of the man who yields to them.

§ 14. We have already had occasion to note how the simpler factors of psychic states become fused and modified by the development of function, in the case of the "sensation-complexes." This fusion and absorption of the single factors into one complex resultant lies far below all "association of ideas" properly so called. It is indeed, an important basis of all intellectual development; inasmuch as assimilation and discrimination must go hand in hand in the evolution of mental life. Popular language notes the application of this principle to feeling when it tells of "being attracted" or "repelled" without knowing why; of "some-how-or-other" liking this and disliking that. The person who, on first trial, pronounces against the taste of olives, may have to be told that perhaps this is because they "suggest" the taste of leather. All colors, when uninfluenced by association and contrast, are probably to be regarded as pleasant, if not too intense; but to most persons certain colors seem "naturally" disagreeable.

The use of the word "association" indicates how far from what is truly simple and primitive in the life of feeling we have already departed. We must therefore now turn to the consideration of other elementary forms of mental processes in order that we may understand the higher forms of affective phenomena.

[Among the recent general works on psychology accessible in English, the treatment of feeling is most satisfactory in the following three: Höffding, pp. 221–307. Sully: The Human Mind, II., pp. 1–171. Baldwin: Feeling and Will, pp. 89–279. For the psychology of bodily pleasures and pains—see Bain: The Emotions and Will, pp. 1–68. Spencer: Principles of Psychology, I., § 122 f., and Marshall, articles in Mind, lxiii. and lxiv. Special monographs of value are Beaunis: Les Sensations internes. Bouillier: Du Plaisir et de la Douleur. Körner: Das Körperliche Gefühl. Külpe: Zur Theorie d. sinnlichen Gefühle. Horwicz: Zur Naturgeschichte d. Gefühle. Braubach: Psychologie d. Gefühles. Von Ehrenfels: Fühlen u. Wollen. Nichols: The Origin of Pleasure and Pain. Paulhan: Les Phénomènes affectifs, etc. Jungmann: Das Gemüth, etc. Nitsche: Versuch einer einheitlichen Lehre von d. Gefühlen (especially compact and suggestive). Steinitzer: Gemüthsbewegungen. Letourneau: Physiologie des Passions. Lehmann: Die Hauptgesetze d. menschl. Gefühlslebens.]

[1] The Human Mind, II., p. 36 f.

CHAPTER XI.

CONATION AND MOVEMENT

THERE is obvious need of a word which shall stand for that third aspect of, or factor in, all psychic facts which is neither sensation or ideation with their objective reference, nor feeling regarded as passive condition of being. This need is not satisfactorily met by the word "Will." For, first, this term is surrounded by ethical and theological prejudices from which it is difficult to free it; accordingly it is ill adapted to designate such a primitive psychical phenomenon. But, second, in reality the will is a development conditioned upon a course of varied experiences. For these reasons we have already chosen the word " conation," to correlate with sensation and feeling, in the most fundamental use of the latter terms.

Here again that must be said of conation, as such, which has been found to be true of sensation and feeling. Conation, considered as simply this and nothing more (without reference to the guidance of discriminative consciousness for the reception or rejection of some objective element and without *motif* from the spur of feeling (or coloring from its tone) is an abstraction of psychological science. Consciousness gives no experience of simple unmixed conation. Closely connected with this similarity of the three fundamental forms of all psychic life, an important contrast emerges to view when we compare conation with sensation and feeling. We have been led to distinguish *kinds* of sensation and feeling; but psychic facts, so long as they are considered simply in their conative aspect, have only *one* kind. The most radical distinction which can be made among different primary conations applies rather to the connected phenomena of presentation and feeling than to the conations themselves. The differences belong only to the occasions on which, or the circumstances under which, the different conative phenomena manifest themselves. *As such, there is only one sort of conation.*

The psychology of conation, considered as a primitive proc-

ess in mental life, is, therefore, of necessity, very meagre. Here science can do little more than to notice the universal psychic fact, conjecture its physiological conditions, and point out its place and connections in the scheme of fundamental motor activities. It is only when intelligent grasp and affective appreciation of ideal aims (in the most general meaning of the word "ideal") have developed, that psychology can return to the conative aspect of all psychic facts and establish a doctrine of the development of will and character.

None the less is it true, however, that the presence of the aspect, or factor, of "conation" must be recognized in all psychic facts, and in all development of psychic faculty. To be the subject of any psychosis is always—to speak roughly—to be doing something. Every sensation and idea, every phase of changeful feeling may be said (with no unmeaning figure of speech) to furnish the soul with a challenge to arouse itself and "act out its own nature," "or express its will." Nay, more: so far as we can obtain evidence concerning the very beginnings of mental life, coetaneous with the first having of sensations and the most primitive experience of being affected with pleasurable or painful feeling, spontaneity of active consciousness, psychical doing and striving, may be discerned. Speaking broadly and using terms whose meaning and justification will be considered later on, we may say: We never know nor feel, that we do not also will. Conation (or volition) enters into all perception, memory, imagination, thought. No state of suffering or happiness is so passive or so "overwhelming" that it is not, by the conative activity which accompanies all conscious life, accepted or striven against, and thus modified by that spontaneity of action which belongs to the nature of the subject of this life.

Conation is uniformly connected with two most important classes of effects: These are (1) the movements of the bodily members; and (2) the determination of the direction and amount of attention—the fixation and distribution of psychic energy in the so-called field of consciousness. To test these statements, let one ask one's self this question: Besides "having" a great variety of sensations and ideas, and "being affected" with manifold changing feeling—*What can I do?* The naïve answer to this question will be found to resolve itself into claims corresponding to such statements as follows: "I can make certain bodily movements *as I will;*" and, "I can attend, within certain limits, to *what I will.*" Scientific psychology refines, explains, and circumscribes these statements by analyzing the psychic facts to which they appeal, and by specifying the organic conditions

on the basis of which these facts occur; but the import of the statements remains essentially unchanged under all scientific examination.

Bodily movement and the fixation and distribution of attention, however, are themselves most closely interrelated and mutually dependent. This important truth is not sufficiently recognized in any merely popular estimate. Indeed, if we include, on the motor side, all so-called "automatic" excitation of the cerebral motor elements, and all inchoate movements and tendencies to movement, or conditions of "tension" and "strain" in the external motor apparatus, it may be claimed that attention and movement are probably always correlated. It has already been found that acts of primary attention are strictly correlated with irritation of the striated muscle-fiber; and hence the claim of some writers, already referred to: Attention "acts only upon muscles and through muscles" (see p. 67 f.). Let but attention be directed toward any sensation or sensuous object, and at once the organ through which the object of sense is presented, or the area of the organ which receives the sensory stimulation, is thrown into a changed motor condition. Probably also mental images cannot be attended to without the realization of changes both in the correlated cerebral centers and in the corresponding external organs. Again, the direction of attention to any particular part of the motor apparatus, or even to the mental image representative of any particular movement as possible to be executed by any part, immediately tends to realize itself in corresponding actual movement. On the other hand, all forms of organic movement, whether of the bodily members as masses or in the form of molecular changes in the so-called motor areas of the cerebrum, tend to excite and to fix attention.

Moreover, all primary attention, regarded as spontaneous psychic activity, however occasioned or influenced, may be said to have its conative side. Indeed, thus regarded, attention is preëminently conative—an elementary, and yet true "act of will." In other words, *attention regarded as active consciousness implies conation; and inasmuch as primary attention belongs to every field of consciousness, and attention is a most general form of all mental life, conation, as the activity of attention, belongs to every psychosis.* To this conative aspect of all mental life corresponds all centrally originated and centrally modified or directed movement of the bodily organs. Thus the early development of will is primarily conditioned upon the increasingly complicated and purposeful fixation and distribution of attention with its correlated movement of the bodily organs.

§ 1. The employment of the word "conation" as the correlate of sensation and feeling in the triple division of elementary psychic functions is not without objections. Like every other term it is liable to be misunderstood, or, if clearly understood, it may be misapplied or its appropriateness altogether denied. We choose to accept it and limit its use on account of the necessities of the case. The psychological distinction between intelligent and so-called blind "appetencies" or psychic forthputtings (ὀρέξεις) is as old as Aristotle. The recognition of "exertive or conative powers," as corresponding to fundamental distinctions that pertain to all psychic facts, we have already seen was promulgated by Kant. The English ethical writer, Cudworth, in "A Treatise on Free Will," speaks of the "hegemonic of the soul" as acquiring more and more power over the feelings by "conatives and endeavors." Hamilton,[1] after discussing and rejecting various other terms, adopts the word "conation" as covering both desires and volitions. The use of the term here adopted is both more wide and general in one direction, and more restricted in other directions, than either of the foregoing uses. "Desires" are complex psychical phenomena, implying at least an obscure presentation of something desirable to be had, and especially the arousement of feeling in one direction and in an "influential" way. Desires are therefore more predominatingly presentative and affective than are *merely* conative phenomena. And although we undoubtedly designate by "volitions" (as distinguished from mere "wishes" or "desires"), those psychoses in which the conative element is predominant, unless we exclude from this term its implication of the conception and selection of an end, it is wider in some directions and narrower in others than the term conation.

The term "active consciousness" has been suggested as the equivalent of conation considered as the third of the three fundamental and coördinate modes of mental life. Thus Sully[2] says: "The most obvious common characteristic in this variety of actions or conative processes is, as already suggested, that peculiar element which is best marked off as active consciousness." This phrase, indeed, suggests a most important truth respecting the conative aspect of all mental life. This truth is that of the fundamental, irreducible, and indefinable fact of conscious psychic activity itself. The phrase seems, however, to introduce a distinction between actions and motor activity which is somewhat confusing and difficult to keep in mind. Even the most passive form of suffering which I "undergo" is an action, a mode of the behavior of the psychical subject of states. But besides its passive aspect—its being a state which I *undergo*—the conative aspect of all suffering is emphasized when I consider that it is *I* which undergo this suffering—by "bracing up" against it, or resisting it, or by patiently or impatiently enduring it, or by striving to free myself from it, by withdrawing the body from the painful irritation or distracting attention from the pain. As Höffding has said: "We speak of volition whenever we are conscious of activity, and are not merely receptive. But . . . . we never are purely receptive."

Another writer[3] has proposed an analysis of "motor consciousness" as the starting point for the discussion of Will. But, strictly speaking, motor

[1] Lectures on Metaphysics, p. 127 f. [2] The Human Mind, II., p. 173.
[3] Baldwin: Feeling and Will, p. 280 f.

consciousness is tinged through and through with *sensations* of motion and bodily *feelings;* it is by no means pure conative consciousness, although it properly implies a dominant element of such consciousness. The word "impulse" (*Trieb*) might be substituted for conation (it would be preferable as the less technical word), were it not needed to designate certain more complex mental states, akin to desire, which emphasize other factors than the strictly conative.

§ 2. The psychological equivalent of the term "conation" can only be recognized; it cannot be defined or reduced to anything simpler by no matter how subtle and searching analysis. Reflective consciousness can be best assisted to the act of recognition by describing what is *not* meant by conation, as we have chosen to employ this term. Therefore, first, no unconscious process of bodily or mental life is here designated. We must be warned, then, against both the metaphysical and the biological or physiological use of the terms "conation," "impulse," "volition," "will." Concerning the question whether Will is indeed the ground of the world, its real being (so Schopenhauer), or the core of human personality (as "the heart of the heart"—so the theologian Müller), scientific psychology does not inquire. Neither does it, so long as it avoids metaphysical implications, ask whether a psychical principle, like the faculty of willing, can stand in relations of a *vera causa* to physiological processes in the brain or elsewhere. It simply finds conative consciousness given as an undoubted factor in determining the amount and direction of attention, the control of the mental train, and of the movements of the bodily organism. As *psychological* science our investigation accepts this ordering of phenomena; it is no less fundamental and conclusive than are those data upon which physics strives to establish the principles of the conservation and correlation of energy. Moreover, all the information which cerebral physiology can furnish regarding the processes that accompany or—if one please—underlie conation, volition, striving, etc., consists only of conjectural preconditions for this primary and indubitable psychological fact. [We turn aside barely an instant to affirm that the more acute and prolonged metaphysical analysis becomes the more clear is the conviction that the most highly developed notions of "Reality," "Cause," and "Energy" ("conserved" and "correlated"), within the physical realm, are themselves dependent upon this very datum of conation, or active consciousness, belonging primarily to man's mental life. These notions cannot consistently, therefore, in the name of so-called physical science deny the existence and validity of the psychological fact on which they all repose.]

But, second (and positively), by conation we *do* mean to designate a primary and indubitable datum of consciousness. To repeat the truth which came before us while studying the nature of attention:—*All psychic life manifests itself to the subject of that life as being, in one of its fundamental aspects, its own spontaneous activity.* All complex psychic facts are fully described only when we add to the phrases—I have such sensations, and recognize such objects, and feel affected so and so—this other equally pertinent and necessary declaration: *I now act* in this or that way. Prior to the debate which Materialism and Determinism excite, and equally indisputable in whichever way this debate may be decided, is our immediate recognition

of this datum of self-activity. Conscious activity, as tinged by the feeling of being resisted, is called "striving." Conative consciousness is, therefore, at the same time spontaneity of activity, and consciousness of activity. This is equally true whether the striving, as regarded from the point of view of the practical ends aimed at, be successful or not. "Hold still!" the mother says to the child, or the surgeon to the patient writhing under pain. "I am trying to," is the reply; and it matters not whether the phrase appended be —"but I cannot," or "and I will."

§ 3. Like all other fundamental forms of psychical life, conation differs in the degree of its manifestation within wide ranges of magnitude, and in dependence upon constitution, temperament, mood, habit, culture, etc. It is partly this variation to which we refer when we speak of men of "weak wills" and "strong wills," "steady purposes" and "fickleness of purpose," etc. It is the amount and persistency or changeableness in time of conation which forms the basis for the different "kinds" of will so called —in so far as classification has to do at all with the conative aspect of consciousness itself. Otherwise the development of will and the formation of character depends upon the knowledge attained as to different ends, and as to the means of reaching them, and upon the kind and amount of feeling aroused by contemplation of these ends. While here, as in every domain of mental life, the great principle of habit takes an unceasing and conspicuous part.

The Physiological Conditions of Conation, so far as science can disentangle them, seem to lie in that "automatic" molecular activity which belongs to every living cell, but peculiarly to the central nervous masses. The sentence which we have already quoted from physiology concerning the amœba—it "has a will of its own"—indicates that certain molecular changes in the lowest living forms appear to have an altogether mysterious internal origin. It is indeed difficult to make sure that any particular form of internal commotion does not arise through irritation of the surface by stimuli belonging to the environment. To prove a negative here is always difficult. Some writers on physiology strive to explain all the movements, not only of the simpler amœboid bodies but even of the most complex organisms, as falling somehow under the term "reflex." But he who has watched even an amœba under the microscope, and noted the unexpected, inexplicable, "self-originated" character of much of its motor activity, will probably be gravely dissatisfied with such easy-going explanations. The more careful and unprejudiced our study of the behavior of micro-organisms becomes the more difficult do we find it to bring all the phenomena of their movements under terms of a molecular mechanism that is excited to re-act solely by the application of stimuli to its periphery. As the student of physiology rises higher in the scale of life, he finds the number and complication of the phenomena

that baffle explanation by way of merely reflex-motor hypotheses greatly increased.

According to a general biological law, the constitution and functions of the higher nervous centers become more important and determinative for the whole realm of bodily and of psychic life, as we ascend the animal series. At the head of this series stands man. The supreme nervous centers of man are at the same time most intricately organized as physical structures, and also, relatively, most influential for the control of all the physical and mental development of the animal. Accordingly, the "automatic" (or centrally originated) functions of the human brain are far more comprehensive and controlling than are the automatic activities of any other nervous mechanism. In other words, what the *brain* of a human being is, and what it does of itself—so to speak—has far more influence in determining the character and the development of the entire life of the individual, than in the case of any other animal.

It is not with perfect certainty but with a high degree of probability, that we are able to say: "*automatic*" (*or centrally originated*) *nervous activity is the peculiar physical correlate of active consciousness, of the conative element in all psychic life.* The enlarged amount of this form of neural activity in man's brain corresponds, on the physical side, to his superior intelligent control over his own bodily and mental evolution. The "automatically" acting brain and the "autonomous" (or self-active and controlling) mind may be said to be correlated. How, exactly, we shall express the terms of this correlation—whether as reciprocal cause and effect, or as two "aspects" of one entity, metaphysics must inquire, and determine, if it can. But scientific psychology simply recognizes the nervous "automatism" of the brain as apparently the indispensable physical condition of that conative element which consciousness recognizes as present in all psychic facts. On the one hand, scientific physiology vaguely accounts for this automatism by speaking of the constitution and vital functions of the brain, the changing character of the blood supply, the influence (perchance) of mind over body, etc. On the other hand, scientific psychology recognizes the presence of conation as an unexplained psychic fact—itself needed to explain the possibility and the character of all truly human psychical development.

§ 4. By "reflex" changes physiology understands those which are brought about in the striated muscles, vaso-motor apparatus, etc., by applying stimuli to the periphery, and having the nerve-commotions thus induced pass, by the afferent nerve-tracts, to the central organs; whence they

are then "reflected" backward by efferent nerve-tracts, to the periphery again. But, especially in the case of the more highly organized animals, this so-called "reflection" always depends for its character upon the structure and condition of the central organs themselves. However, in a large class of such changes the reflex process takes place with the regularity of a machine; its kind and amount are determined by the kind and amount of the stimulation, by the place of the application, etc. On the contrary, by "automatic" changes are meant those induced by nerve-commotions, which originate in the central organs themselves, and then pass down the efferent nerve-tracts. The excitement of the central organs may be conjecturally ascribed to any one of several causes; all that is necessary, in order to justify our speaking of it as "automatic," is that the kind and quantity of nerve-commotion started should be determined by conditions lying within the central organs.

In all the vertebrate animals, including man, the spinal cord is the type of complicated reflexes. This fact may be determined experimentally by severing the cord from the brain in the case of the lower animals, and then observing what functions this disconnected cord can perform. Especially in man's case, is it found that the control of the cord, and of the functions of the lower parts of the brain, depends upon the higher cerebral centers. Within these centers the automatic activities arise which so largely determine what shall be done by the lower and inferior portions of the nervous system, and so by the entire body.

But, further, modern experimental physiology has discovered that certain particular areas of the cerebral hemispheres are related in a special way to the particular classes of sensations, and to the complicated and purposeful movements of certain parts of the body. Thus it has shown that definite and intelligent conation requires the integrity of these areas. It has, however, discovered no one area, or center, which sustains a special and unique relation to all conation, as such. We seem warranted, then, in saying that there is no special organ of will; but that *whenever conation exists in consciousness then, at the particular cerebral area corresponding to the definite characters of the conation* (the movement of a particular part of the body, or the focusing of attention in a given direction, etc.), "*automatic*" *nervous action is taking place.*

§ 5. Regarded objectively—that is, as mere movement without any psychical antecedent or equivalent—these "automatic" (or centrally originated) changes of the bodily members are only analogous to so-called acts of will. They require time for the elaboration (analogue of "decision") of the process which results in movement; the nature of the movement, and even the question whether there will be movement at all (analogue of "choice"), is always relatively uncertain. For example, it can be predicted how, and how much, the decapitated "frog-preparation" will move the limbs under different stimulations of acid or of the electrical current.[1] Leave to the frog its medulla oblongata and optic lobes, and it will croak, when stroked, with the regularity of a music-box; it will also perform, in the most orthodox fashion, many remarkable feats of co-ordinating the muscles. But one can never tell

[1] For a statement and discussion of the laws of such "reflexes," see the author's Elements of Physiological Psychology, Part I., chapter iv.

whether the full-brained frog will leap or croak in response to stimulation; and if it leaps at all, one is in even more doubt as to the direction and amount of its movement. If the legs of the normal animal be dipped in dilute acid, the brain and the cord will be longer (more "deliberate") about removing them than will the cord alone. Thus also the pigeon, whose cerebral hemispheres have been removed, differs from the normal bird no less in respect to the amount of "spontaneity" which its movements show than in respect to deficient sensations and intelligence. In general, one can predict far better what molecular nervous mechanisms that are largely or purely reflex, that have no "will" or "pleasure," will do; but when, or how, the superior central organs will act automatically, will *will*, or will *please* to do—this is quite another matter.

For although the language just employed is figurative and the facts described are, perhaps, not psychological phenomena at all, it correctly expresses our statements concerning the real, but as yet quite inexplicable, physiological basis of conation.

The fully developed Psychological Expression for Conation is, then, as follows: I act and I know that I act—this as truly as I see, or hear, or feel pleasure or pain, and know that I have the sensation, or am subject to the pleasure or pain. For *psychology*, active consciousness, is identical with consciousness of activity. Hence the motto: "In Willing *we* work, but Wishes play *with* us." Indeed, if any statement, based upon purely psychological grounds and having to do with the description and explanation of facts of consciousness, as such, can be depended upon, it is that which affirms the continual presence of conation as consciousness of activity. Indeed, here we reach the most fundamental of all psychic phenomena. *Whatever the sensation may be, among the great variety of all possible sensations, and whether the dominant tone of the infantile consciousness be for the moment pleasurable or painful, conscious striving enters into all the most primary psychical states.*

Now, since "automatism" appears to be the peculiar physiological condition of this spontaneity of psychical activity, it is sometimes proposed to consider conation, or active consciousness, as the consciousness *of* the automatic (or centrally initiated) nervous processes of the brain. But furthermore, these processes result in the "innervation" of the organs of sense in connection with the fixation of attention, of the muscles of the body that, by contraction and relaxation, carry the limbs through space. Centrally originated processes, which flow down the outgoing nerve-tracts and "innervate" (and so induce motion in) the peripheral parts, are called "motor" processes; and the cerebral areas where these motor processes are set up are also called "motor." Hence the much debated question whether the con-

sciousness of activity is a consciousness of "motor" processes of "innervation" in the centers of the brain.

Our position toward this much debated question requires mention of the following three points: (1) To speak as though any form of mental life were a "consciousness of" a nervous process, whether centrally or peripherally originated, is to use a misleading figure of speech. It can scarcely be too often repeated: the nervous processes are regarded by psychology only as the physical preconditions of those facts with which it properly deals; the latter are the facts of consciousness, as such. The question, therefore, requires to be restated, as follows: Does the character of consciousness depend at all upon the automatic cerebral processes? and, if we answer this question affirmatively —Is not conation, or the consciousness of activity (the "doing" aspect of all psychoses) chiefly correlated with these peculiar processes? Now, both these questions may, with good show of reasons, be answered affirmatively. (2) The "feeling of effort," or the consciousness of exerting ourselves in the "accomplishment of something," as this feeling exists in all our developed mental life, is exceedingly complex. It doubtless contains a large admixture from peripheral sources. The sensations of tension, strain, and motion, which blend with all our active consciousness, give to it an emotional character. They make our movements, and our attempts at movement, *interesting;* because they are tinged with pleasure-pains of various kinds. Their importance in the development of will, of conduct, and of character, is very great, and will be considered later on. But (3) our entire active consciousness, our awareness that we are doing something, is *not* wholly a compound of sensations originating in the condition of the external organs. In other words, *in all motor consciousness there is a conscious conative element which is the correlate of the automatic motor nervous processes that innervate the organs of sense and of motion.*

Closely connected with the position just taken is another of equal psychological importance. In the momentary flow of consciousness, and in the larger history of psychical development, conation is indissolubly linked with motor changes. All my experience, so long as I consider it from the psychological point of view, affirms:—*I will;* and innervation of the organs of sense or of motion follows, *because* I will. Or—to state the case as is fitting at the present stage of our discussion—*active consciousness, with its dominant of conation, is regularly followed by modifications of sensation and feeling;* and upon the basis of such constantly recurring experience all the intelligent development of mental

life is based. Conation, as distinguished from sensation and feeling, is then a determining factor which must constantly be reckoned with in the description and explanation of psychic phenomena. [This position is forever true in scientific psychology, whatever the metaphysics of physics and physiology, on the one hand, or of theology, on the other hand, may theoretically conclude as to the meaning and propriety of the word "cause" when applied to relations between body and mind.]

Conation as a determining factor, whether with reference to the fixation and distribution of attention or to the movement of the larger masses of the body, operates in two directions. It determines positively or it determines negatively. It controls both by incitement and by inhibition. Thus, in the development of purposeful volition, and in the choice of ideal ends, it comes about that I will either to attend or not to attend, either to move or not to move. I, moreover, consciously select, as it were, and innervate the different organs of sense and groups of muscles connected with the various movable members of the body. As the different mental images, ideas, and conceptions free themselves more and more from their more obvious sensuous bases, and the æsthetical and ethical feelings develop, I may also subject the entire mental train and bodily conduct to remote and deliberately chosen ends.

§ 6. It is doubtful whether there are any experimental means of deciding beyond question how far our so-called "feeling of effort" is determined by centrally initiated and outgoing motor processes. The negative answer to the question is given by writers like Ferrier, James, Münsterberg, G. E. Müller, and others; the affirmative is maintained by Bain, Wundt, Beaunis, Preyer, and many more.[1] We have already ranged ourselves with the latter authorities. Following are, in part, the proofs of this view: (1) From the earliest dawn of consciousness to the highest point of mental development no *purely* "reflex" and no *purely* "automatic" nervous processes take place in the brain. These two—*i.e.*, the processes peripherally excited and destined to return upon the external organs after having passed through the central organs, and the processes set up in the latter organs themselves as the result of intra-organic stimulation—are ceaselessly conjoined. Experiment can never disentangle them. No brain ever reacts on sensory im-

[1] This inquiry has been conducted with an energy and warmth somewhat proportionate to its importance. It will be seen, on a little reflection, how really great this importance is for those who hold to the strictest interpretation of the theory of correlate processes in brain and mind. The affirmative answer seems to such to contradict the attempt of those who give the negative answer, viz., the attempt to reduce everything in the psychical life to a sensuous and, as it were, passive basis. The works just referred to are chiefly the following: Ferrier: The Functions of the Brain (1st ed.), chap. ix. James: Feeling of Effort. Münsterberg: Die Willenshandlung, pp. 62 and 67 ff. Müller: Pflüger's Archiv, xlv. (1889), p. 30 f. Bain: The Senses and the Intellect, p. 59 f., and The Emotions and the Will, p. 808 f. Wundt: Physiolog. Psychologie, II., p. 463. Beaunis: Les Sensations internes, chap. xi. Preyer: Mind of the Child, I., p. 201 f. Bastian: Rev. Philosoph., 1892.

pulses irrespective of its own vital constitution and intraorganic condition. This is the same thing as saying that all reflexes which pass through the brain involve automatic elements. The latter, the self-originated elements, are the more important the more complex the brain is and the more highly developed it becomes. (2) Automatic activities, having a varied motor outcome, undoubtedly take place in the central organs, especially of all the more highly organized animals. In proof, Bain has emphasized (pertinently, if unduly) the vast amount of random activity, the ceaseless moving of limbs—kicking, striking out, contortion, squirming, etc.—of the newly born child. We cannot, indeed, separate these movements from the excitations of sense which are storming every area of its body. But Preyer points out that even the embryonic child frequently moves under circumstances such as that no possible sensory impulses would seem to account for it. Other important biological facts do not accord with the theory which holds that all movement originates in sensory impulses.

(3) The attempt strictly to mark off from one another the sensory and the motor elements in the brain is not successful. But this very fact tends to establish the proposition that those centrally originated changes which stand just antecedent to the down-going nervous impulses, by which the end-organs are innervated, have their characteristic effect upon consciousness. It is to them that we look for the conative elements of consciousness, the awareness of that activity which, in experience, is followed by motor effects. To suppose that such physiological and cerebral "innervation"-processes have no correlate in consciousness is to go contrary to all that we know concerning the physiological conditions of all consciousness. (4) Various experimental proofs exist of the view that active consciousness (improperly called "sensations of innervation") depends upon those centrally initiated nervous processes which are connected with the motor innervation of the end-organs. On the whole, the evidence seems conclusive, although there is no single item which may not be disputed. Among favorable facts, the following are important: (*a*) The whole complex feeling of effort does not appear to run parallel in intensity with the actual movement accomplished by contracting any of the muscles; and this indicates an element in this feeling which is of purely central origin. (*b*) Subjects afflicted with peripheral paralysis still have the feeling of effort in such manner as to imply that it is partially of central origin. (*c*) The extreme rapidity with which some minute voluntary adjustments, like those of the larynx, have to be performed seems to indicate that "the outgoing currents must be measured out in advance of our feeling of these effects."[1] (*d*) The diminished efficiency of our muscles when we are fatigued by repeated volitions seems to be due rather to cerebral exhaustion than to exhaustion of the muscles. (*e*) In judging of the difference between movements willed and those actually executed we seem, in some mysterious way, to be dependent on our estimate of the "impulse to action" even more than upon our estimate of the actual movements of the active organ. (*f*) Another observer[2] finds evidence of the truth of this view in the "discovery that right-handedness develops in infancy only under conditions of muscular effort."

[1] On this point see A. D. Waller: Brain, 1891, pp. 189–249.
[2] Baldwin: see Science, xvi., 1890, pp. 247 and 302.

This fact must be due to the child's vague consciousness, centrally originated, of greater motor readiness, or "higher pressure" toward outward discharge, in the use of the right arm than of the left.

We conclude, then, that while our knowledge of the amount and direction of the motor effect is mainly due to sensation-complexes which originate in the condition of the external organs, we have also a consciousness of self-activity whose physiological correlate is the central process of innervation. In the somewhat figurative language of M. Fouillée,[1] "the feeling of cerebral discharge" is an element of prime importance in "the appreciation of energy deployed." But confessedly we localize the movement resulting and judge its extent and direction largely through sensations of muscles, joints, and skin.

§ 7. From the psychological point of view (as distinguished from the doubtful metaphysical or physiological points of view) active consciousness, or conation, is a factor *experienced* as determining changes in the immediately following psychic facts. The order of the psychic facts, of the changes as they appear in consciousness, does not, however, inform us accurately as to the order of the physiological processes. Thus, in the rapid performance of all impulsive and habitual movements a large part of what goes on is purely reflex, or unconscious automatic, physiological processes. This part has, that is to say, no discernible representative in consciousness. It is done *for* the psychic life by a physical automaton rather than *in* or *by* the psychic life. When this automaton once becomes trained under conscious psychical influences, it performs many highly complicated and purposeful motor changes, without "troubling" the flow of consciousness to pay attention to them. At any time, however, these motor changes may break over into the flowing stream of consciousness and strongly affect its entire character as respects sensation, feeling, and conation. Thus one winds one's watch unconsciously, but is awakened to the fact that one is winding it by the unpleasant sensations and efforts which follow the attempt to go on turning the key after the watch is wound up; or one takes unconsciously from one's pocket a bunch of keys and "finds one's self," with a feeling of surprise and confusion, trying to open the door of the study with the key belonging to a box in the safety-deposit; then one recalls that one was thinking about money matters, and not about studies, as one approached the door.

Complicated unconscious or so-called subconscious movements, in the greatest variety, take an important part in the development of organic life. But their existence and influence do not abate one whit the certainty or force of the other conviction: *conation, as a datum of consciousness, determines for our subsequent conscious experience the color and direction of the current of consciousness.*

§ 8. The effect of conation in the fixation and distribution of attention has already been remarked. Experiment confirms the popular persuasion that active consciousness not only determines the speed, energy, rhythm, and sweep of our muscular contractions, and so the complexity and form of the resulting movements, but also is able within certain limits to suppress or *inhibit* the movements which would otherwise be called forth by external

[1] Rev. Philosoph., Dec., 1889, p. 576 f.

or internal stimuli. Thus Brücke has shown that we can, by striving against it, lessen the effect of the direct stimulation of a muscle by electricity. Eichhorst has called attention to the fact that the trembling of palsy can partially be suppressed at will; another experimenter has shown that the reflex stimulation of the eyelids with vapor of ammonia can be voluntarily inhibited. Scores of similar experiences might be pointed out.

The mechanism of inhibition is exceedingly obscure; but the most recent researches seem to show that it does not differ essentially from that employed in the positive innervation of the muscles by active consciousness.

The reaction-time of inhibition, after brief practice, does not differ from that of direct impulse.[1] When the tension and amplitude of the muscular excursion are varied, the change in inhibition-time follows closely upon the change in impulse-time. The attempt has been made to account for the inhibition of muscular contraction as due to the contraction of "antagonistic muscles." But conation has the same inhibitory power over muscles that have no antagonistic muscles. It seems fair to infer then, that the influence of conation over movement may, in the two forms of impulse and inhibition, originate in the same psycho-physical centers and follow the same paths outward. The masseter muscle, the muscle used in the accommodation of the eye, and the muscles controlled by the facial nerve, are instances of so-called "autonomous" muscles. This latter group has the most direct anatomical connection with the higher motor centers—the centers in which resides the supreme power of autonomous innervation. And what a servant of a *willing* soul are the muscles controlled by the facial nerve; and how by striving for and against the expression of consciousness through these muscles, does the psychic life manifest itself!

The earliest manifestations of mental life, as a blending of sensation, feeling, and conation, are seen in certain Classes of Movements. The principles on which the bodily movements are classified, are necessarily somewhat indefinite. This grows, in part, out of the fact that either sensation, or feeling, or conation may be prominent in the total state of consciousness which is connected with the use of the different muscles. Hence to introspective analysis the psychical origin of the movement seems in general to be in the more obtrusive of these psychical factors. Thus one may move any limb, or the whole body, because one sees, or hears, or touches some object—and this without feeling or conation being prominent. But, again, sensations of a relatively weak intensity, if connected with pleasurable or painful feeling, may give rise to relatively strong movements, which have the end of retaining an attractive, or removing a repulsive, mental excitant. And, in not a few cases, complicated and strong bodily movements follow immediately upon intense feeling, when no intelligent apprehension of any end to be attained

[1] See for these and other facts the exceedingly interesting article of J. Orschansky, Archiv f. Anat. u. Physiol. Psycholog., Abth., 1880.

by movement is present in consciousness. Yet again, not a few movements originate, especially in the earlier and relatively unorganized stages of mental life, when no sensation, idea, or feeling is to be detected in the field of consciousness, to which the exciting cause of the movement can be ascribed; and yet the movements cannot be classed among purely physiological reflexes, because the excitant of them is to be found in a dominant condition of consciousness. Here *conation*, in the sense in which we are using the word, may be said to originate movement. *Mere psychical forthputting*—as it were, blind and unconscious of an end, and not effected by any discernible form of sensation or feeling—is often the antecedent of random changes in the position of the limbs, of quiverings and rollings of the internal organs, tensions and strains of the aimlessly innervated organs of sense.

We anticipate what will appear more clearly after subsequent discussion in saying, that representative images, or "ideas," may also serve as the dominant excitants of bodily movements. It is this, indeed, which makes possible the development, as a living unity, of the continuous stream of consciousness and of the reciprocal changes of bodily organs in their changing relations to consciousness and to the external environment. As conation becomes more purposeful, the resulting bodily habits become more adjusted to "ideal" ends. Hence the dependence of volition, choice, and so-called "free" will, upon memory and imagination. Thus conduct is made to correspond to ideas—in the broader sense of the latter word.

One general psycho-physical principle of great import must be accepted in this connection. *All forms of sensory, emotional, and ideational cerebral excitement tend constantly to "overflow" the centers and areas in which they originate, to flow down the motor tracts, and then to set in movement the different connected parts of the external motor apparatus.* Where the cerebral excitement is not intense and is definitely located—as in the case of great numbers of the sensations, representative images, and conations—the cerebral motor discharge is limited to single muscles or to coördinated groups of muscles. But the summation of repeated excitations of a small intensity, and single excitements of an originally high degree of intensity, tend not only, of course, to diffuse the cerebral nerve-commotions over larger and larger areas of the central organ itself, but to overflow down an increasing number of the motor tracts. Hence the well-known fact that any strong mental excitement—whether of the predominatingly sensory, emotional, or conative type—throws into action a large

portion of the motor apparatus, *unless* this tendency to movement be suppressed. And here again, the partial or complete suppression, or inhibition, may arise, apparently, in several different ways. To express the matter popularly we may say: one intense sensation, or vivid mental image, or strong feeling, or earnest striving, may be prevented from finding expression in movement by another intense sensation, or vivid mental image, etc.

The general theory of the relation of psychical excitements to bodily movements, when worked out in detail with a careful regard to the facts, shows us that the ordinary distinctions as to the classes of movements are only relative. In general, the "co-respondent," or correlate, of mental excitement is bodily movement; when the psychical life is stirring, in whatsoever degree or manner, a corresponding effect may be expected in the physical motor apparatus. This all comes about naturally and necessarily, on account of the nature of the brain and peripheral nervous system, and of its relation to psychical states. Hence movements which are the same, externally considered, may originate in any one of several different ways; and any movement may belong at one time to one of the principal classes of movement and, at another time, to another one. Hence the very same movement, externally considered, may run through two or three different psychical phases before it ceases as movement. This explains, also, the difficulty, and even impossibility, of telling to which one of the classes exclusively any particular movement is to be assigned. Thus some muscular action may begin as an unconscious reflex and be finished as a voluntary and purposeful movement; or it may begin as "sensory-motor," or "ideo-motor," and end by dropping down into the condition of an almost purely unconscious reflex. And, finally, from neglect of taking all this sufficiently into account many foolish disputes, or gravely erroneous psycho-physical theories, having a bearing on ethics and religion, have arisen.

In the case of semi-conscious, or of awakening and undeveloped mental life (infants, or hypnotic subjects, or instances of acquired "tact"), we have no safe means for dividing the bodily movements into clearly separable classes. Indeed, the great majority of adult movements—perhaps we might even venture to say, all such movements—must be considered as mixed cases: that is to say, all the different main classes of movements are covered, or at least touched, by each particular case of conscious and purposeful movement.

With the foregoing cautions in mind, the following may be

given as the principal classes of movements[1] dependent upon the relation in which the movements stand to the dominant aspect, or factors, of the exciting psycho-physical life: (1) *Random automatic* movements, by which are to be understood such movements as originate chiefly in conation ("blind will"), without definite influence from any particular form of sensation, idea, or feeling. (2) *Sensory-motor* movements are those whose chief psychical excitant consists in some form of sensation. ["*Conscious* reflexes" is a term sometimes given to this class of movements, to signify that the sensory excitation in which the movement chiefly originates does not result in a purely physiological reflex, but provokes an effect in consciousness. Purely unconscious reflexes (merely physiological reflexes, although sometimes called "sensory-motor") do not interest psychology otherwise than indirectly. Through their connection, under the law of habit, with various forms of conscious movement, they are, however, of the greatest interest to psychology. Since by "sensation" we are pledged to understand a factor in consciousness, we employ the term "sensory-motor" for these conscious reflexes.] (3) "*Æsthetico-motor*" is a term proposed (tentatively) for those movements which have their chief psychical excitants in affective consciousness, in feelings, as having—ordinarily if not always—a tone of pleasure or pain.

By different combinations, as it were, of the three foregoing grounds of classification, we are led to distinguish (4) *impulsive* and (5) *instinctive* movements. By "impulsive movements" we understand those in which conation excites and determines movement in connection with sensation and feeling, but without deliberation or intelligent appreciation of an end. And by "instinctive movements" we understand the same kind of movements as those just called impulsive, whenever the sensations, feelings, and resulting movements are related to an end connected with the preservation and propagation of the species, and presumably developed upon a basis of inherited tendencies.

(6) *Ideo-motor* movements are excited, chiefly, by the presence of an idea in consciousness. But inasmuch as no idea, or conception, is a perfectly colorless affair, devoid of all "attachment" of feeling and so unfit to act as a so-called "motive," all ideo-motor movements are also æsthetico-motor. Finally, as possibly (or probably) involving the combination of conscious factors emphasized by each one of the first three forms of move-

[1] Horwicz rightly classifies the bodily movements only after remarking that a strict division cannot be maintained. Psycholog. Analysen, comp. i., p. 7 f. and 81 f. See also, Lotze: Medicin. Psychologie, p. 287.

ment (and, therefore, often discussed as either impulsive or instinctive), another class (7) called *imitative* movements must be recognized. This class comprises those, as a rule, somewhat complex co-ordinated and expressive contractions of the muscles that are called out, in one individual, by the presentation of the movements resulting from conscious ideas and feelings in another individual, without, however, awakening the ideas and feelings themselves, or the conscious purpose to express them. In infants, smile answers "in imitation" of smile, frown of frown, grimace of grimace, etc. But here, and even in the case of many similar movements in adults, it is difficult to tell how much of the result is to be ascribed to the faint startings of inchoate ideas and feelings that express themselves in sympathetic forms of movement, how much to sub-conscious but complicated generic and inherited reflexes, and how much to involuntary but conscious conation finding its way along the well-worn channels of motor discharge.

§9. Few truths in psychology are more frequently recognized than the effect of mental excitement in the production of bodily movements. The infant comes into the world and spends his early waking hours in almost ceaseless movement—crying, cooing, kicking, thrusting out with his fists, wriggling, squirming, rolling his eyes and head, etc. This activity is naturally regarded as due to overflowing vitality and sensitive response to various forms of stimuli. To the observer it seems to proclaim: "I am here, not simply to see and hear, to feel and think, but to *do something*. I must learn to mould and to make, must be prepared for action, not only by getting acquainted with my bodily members, but also by getting them in hand." As the physiologist would express his side of the truth: "The whole brain is made up of structures that subserve sensory-motor processes, and into such processes all its functions may be resolved" (Hughlings Jackson). "Every structure of the brain concerned with sensation proper is connected directly or indirectly with a part concerned with motion" (Gowers). Thus the ceaseless bodily movement of the child is the correlate of its psychical excitability; its mobility and sensitivity correspond in the development of psychical life. What is true of the infant is true of those adult individuals and of those races which have most, in this respect, of infantile characteristics. But since conation expresses itself in inhibition as well as in impulsive movement, and since training of will and character involve *not* following impulses quite as much as the positive following of selected ideas, the suppression of the "natural" tendencies to movement is a necessary part of the formation of safe and intelligent motor habits. Even here, however, what we call "suppression" is accomplished with difficulty and pain, and it is rather apparent than real. If mental excitement is itself allowed to rise, it inevitably expresses itself in tensions and strains, in irregular or spasmodic action of internal organs, and in the pull of the antagonistic muscles, etc.; it is chiefly the more obvious and massive muscular contractions which are really suppressed.

The general fact just indicated has been called a "law of mental dynamogenesis," and has been stated by one writer[1] in the following terms: "*Every state of consciousness tends to realize itself in an appropriate muscular movement;*" by another author[2] it has been illustrated, in an interesting way, in an entire monograph. "Active consciousness" and "motor consciousness"—in the wider meanings of these two terms—are thus found constantly to intermingle and to develop in mutual dependence.

§ 10. The first movements of the child which, physiologically considered, are of central origin and, psychologically considered, are chiefly ascribed to conation, have been called "impulsive" or "instinctive," etc. "Random automatic" seems, however, a more appropriate term. As Preyer has said, such movements should not be called instinctive, "because they have no aim." Among them this author would place the movements of the human embryo in the womb, the child's beating of itself with its own hands, its rolling "aimlessly hither and thither when fast asleep," etc. That such movements as the latter are, in part, mere physiological reflexes, and, in part, conscious sensory-motor reflexes, we have already seen reason to believe. But the early "protrudings of lips," the "asymmetrical grimaces," "abductions, adductions, and rotations" of the arms, "crowings and similar exercises of voice," which the infant, when awake, so abundantly displays, are probably largely due to conation—blind psychical strivings. Something akin to and yet the reverse of this occurs not infrequently in adult consciousness in the case of those random automatic ideation-processes, those unaccountable and purposeless forthputtings of ideas, which occur in times of unregulated mental excitement.

§ 11. Every sensation may be said to have a "dynamogenetic" value and influence, in proportion to its intensity as well as to the way in which it fits in with the entire content of consciousness. If a person is engaged in exerting pressure with a maximum of energy, any form of peripheral excitation may affect the potential of energy. That sensations generally excite movement of the organs connected with the origin and exploration of the sensations themselves is a fact confirmed by abundant experience. Every smell is a challenge to sniff in or blow out the air of the nasal passages; every taste provokes the tongue to move; every sound incites us to innervate the organ of hearing and turn the head in its direction. And let but the finger casually light upon some object, it can scarcely refrain from pressing the object, tracing its outlines, and determining by motion its composition. While, conversely, if any object light upon or move over some area of the skin, the sensation it produces elicits all the motor activities connected with the management of that particular area. And that the eyes shall—"impulsively," as we say—focus upon and follow any bright and moving object is a sort of primary datum. The hypothesis that *all* our movements are determined by sense-stimuli was maintained for the development of visual consciousness, as an inference from the mechanical view of nature before the investigations of modern psychology. John Toland maintains it in his Letters to Sophie Charlotte, Queen of Prussia.

§ 12. The influence of feeling, in the form of interest and pleasure-pain, upon the motor organism is almost too obvious to need mention. Through

[1] Baldwin: Feeling and Will, p. 281. [2] Féré: Sensation et Mouvement.

this influence desires and volitions develop in relation to each other. But the primary relation is antecedent to all conscious desires and volitions. The sentient animal immediately and necessarily *moves* under the influence of pleasure or pain. These forms of psychical life set the entire motor apparatus in a state of activity, and thus profoundly modify the so-called motor consciousness. Thus men go into convulsions over strong pains, or weak pains repeated and summated, as it were; they leap and dance with rage or joy. The depressing forms of feeling, the loss of interest and low-toned monotonous grief, occasion the relaxation and depressed tone of certain groups of muscles; and so the afflicted ones sink their heads upon their breasts, let arms and legs lie flabby, and fall "all in a heap." Children and hypnotic subjects furnish marked examples of this influence of feeling over the motor apparatus and the motor consciousness. Every large insane asylum contains markworthy instances of the same psychological truth.

§ 13. Few words have been used more indefinitely than the words "impulse" and "instinct." The consideration of their full legitimate meaning must be reserved until later on. Obviously, almost all of those movements which merit the names "impulsive" or "instinctive," arise from genuine psychic states having the threefold aspect of sensation, feeling, and conation. Thus the infant sees the bright candle or fire, feels a vague drawing toward it in the form of awakened interest, and "impulsively" grasps after it. Or it hears a sound, is attracted by it, and "instinctively" turns its head in the direction of the sound. In many, and in perhaps the larger number of such cases, however, the intervening factors are eliminated, and the sensations causing the movement fuse with the sensations caused by the accomplishment of the movement. To this complex of sensations, the feeling of pleasure or of pain and the feeling of effort, or of activity, become attached.

We agree with those authors who hold that a distinction between "the impulsive" and "the instinctive" should be observed, even when these terms are applied to primary classes of movement. The impulsive movements are more individual, the instinctive more common and generic. Instinctive movements are, therefore, more definite and uniform; they are correlated with statical, or constantly recurring, stimuli in the environment; they are ordinarily more complex and wonderful when compared with all discoverable influences from external stimuli; and they plainly have for their end the relations of the individual to the species. Instinctive movements of various kinds are, indeed, performed by the human physical and psychical mechanism; but in man's case they are relatively less numerous and important and far less astonishing than in the case of many of the lower animals. Human embryos, human infants even, can *do* nothing comparable to the larva of the stag-beetle that digs for itself a *suitable* (!) cavity, on occasion of its passing into the chrysalis state; or comparable to the worker-bees which are said to construct cells "usually for just the number of eggs the queen will lay."

§ 14. Even the "idea" of movement tends to realize itself in actual movement; while the relation of the mental image of any particular movement to the corresponding actual movement is such that the latter, in a volun-

tary way, is not possible without the former. The attempt has been made to show that, in individuals and in races, the energy of momentary effort is related to the habitual exercise of intellectual functions.[1] In general, negroes are said to have less power of grasp to exert pressure than have white men; intelligent persons more power than persons of low intellect, and so on. It is even claimed that "momentary exercise of intelligence provokes a momentary exaggeration of the energy of voluntary movements." However all this may be, everybody knows that to "think of" doing anything creates its own tendency to actualization in doing. To think of jumping from a bridge, or tower, or bank, is too strong a temptation for some persons safely to try to resist it. One cannot well hold the "idea" of kicking, striking, eating, singing, dancing, fencing, etc., without starting motor tendencies in these particular directions. Indeed, in a large class of our most complicated motor activities, the movement follows upon the idea with little or no conscious intervention of feelings of interest or sign of purposeful conation. Thus I have the idea of consulting a particular book in my library to verify a reference (such a page), and at once I rise from my chair and go through the exceedingly complex evolution of movements necessary to realize my idea. Yet in such a case as this it might also be said: "I *desired* to consult the book and *therefore* I did thus and so;" or, "I *willed* to consult the book, and *therefore* I did thus and so."

It is chiefly under this head that certain movements must be classed which have been, of late, investigated in connection with hypnotic phenomena. These movements are said to be caused by "suggestion." It is impossible to describe confidently the entire complex psychic state which, in infancy or in the hypnotic subject, corresponds to the term "mental suggestion." But after the stage of mental development has been reached in which genuine "ideo-motor" influences can work, it is to these chiefly that we must look for an account of some of the most startling of the phenomena of suggestion. Every sensation-complex awaked by excitement of any part of the periphery, every word of command, or of warning, or of information, immediately awakens its appropriate "escort of ideas," and these suggest and effectuate the appropriate movements. Suggest to the hypnotic subject that he is drinking ink instead of water, and he begins to gag and to spew appropriately; or that he is drinking lemonade instead of vinegar, and he smiles and smacks his lips with pleasure. Put into his mind the idea that his hands are bloody, and his face will express disgust and horror; while his monotonous energy in washing them will rival that of the somnambulist, Lady Macbeth.

We shall soon see, however, that *suggestion* is a term which may be employed to cover a large portion of the mechanism of our entire life of ideation and movement.

§ 15. The imitative movements of early childhood have a complex but not easily ascertainable psychical origin. Here, too, doubtless much must be ascribed to unconscious and conscious reflexes—much, doubtless, but by no means all. Somewhere from the fourth to the seventh month clearly imitative movements may be observed in the child. Preyer tells us[2] that at the end of the fifteenth week, he observed an infant "making attempts

[1] See Féré, Sensation et Mouvement, p. 76.

[2] The Mind of the Child, I., p. 268.

to purse the lips when I did it close in front of him." Later the same child developed, in response to the excitement of seeing and hearing the same thing in others, those expressive movements of the limbs, head, face, and vocal organs, with which all observers are familiar. Nod before the infant and it nods; protrude the tongue, and the corresponding movement may be accomplished by it; beckon or point, and it will successfully undertake the same. Let an adult cough or cry, a sheep bleat or a dog bark, and the young human animal will try its motor apparatus to produce a corresponding sound—often with wonderful success the first time, and while yet at an age of low intelligence. Indeed, almost any motor habits may be successfully cultivated under this principle of imitation. Idiots are often most excellent imitators; and Darwin tells us, in his account of the Fuegians, how imitation prevails among savages and certain animals. Hypnotic subjects can be made to perform a wide range of movements in the same way.

It is not, however, among children, idiots, and savages alone that imitative movements abound. In watching those fencing, dancing, acting a part —movements in any way under the influence of common sympathetic feelings —the tendency to imitate the same movements ourselves is often difficult to resist. We smile at other's smiling, if there be no reason to the contrary; and sounds of weeping, or of that "woe" to which Thackeray makes reference in his essay on crossing the English Channel, are apt to elicit like motor activities in us. In all these cases the amount and kind of conscious feeling and ideation which are awaked in the process of imitation depend upon the character and stage of the individual's development. But certain feelings and ideas are connected with what is inherited and instinctive with the entire human race. For it is *human* to grasp and to fight, to smile and to cry, to pout and nod and purse the mouth, etc.

§ 16. The development of motor consciousness and of movements of the bodily organism, under all these different classes, is necessarily conducted with constant reference to certain principles. Among them the following may be noted here: (1) the *principle of interference*. Certain muscles and coördinated groups of muscles cannot possibly be moved simultaneously. Sensations, feeling, ideas, that express themselves by excitement of "antagonistic" movements cannot, therefore, simultaneously realize themselves. When then they occur in rapid succession, or in confused conflict in the field of consciousness, they necessarily "interfere" with each other's appropriate expressions in movements. The face of an hypnotic subject may be made, it is said, to express pleasure on one side and pain on the other, at the same time; and all men may weep and laugh by turns, and with no long interval between. But at the same instant one cannot abduct and adduct the same limb, or rotate it in opposite directions; few can rival the hypnotic subject to whom reference was just made.

(2) The *principle of fatigue* effects the cessation of movements, after they have been long continued, or intensely executed; it operates also to select those which shall be triumphant in the momentary struggle for existence. Especially is this so when we consider that pain accompanies fatigue. He who tries the trick of seeing how long he can hold his arm straight out, "decides" at the end of a few minutes, that although he *could* energize longer the appropriate muscles, he *prefers* to stop the pain and let the arm

fall. In numerous much more subtle ways the principle determines what movements shall be "preferred" to others. In general, movements of the body, like running waters, select the channels that involve least resistance. And (3) the universal psycho-physical *principle of habit* prevails in the entire realm of movement. By volition, for definite ends, we can indeed "break the cake of custom" and mould it anew; but even this takes place only under the principle of habit.

It is evident that, in speaking of conation and movement as we have done in this chapter, and especially in referring to the vast realm of ideo-motor and imitative movements, we have somewhat anticipated the treatment of subjects which are to follow. But this was inevitable. And it is to the nature of the representative image and its place among the elements, as well as its part in the development of mental life, that we must now turn in order afterward to show how sensation, feeling, and conation combine to make such development possible.

[In connection with the works already quoted in this chapter and in the chapter on Attention, and in addition to the chapters on "Will" in the general treatises on Psychology (of which James, II., xxvi.; Höffding, vii., A and B; and Baldwin, II., xii.–xv., are among the best), the student of this subject should familiarize himself with the phenomena of purely physiological and automatic reactions and of reaction-time. For the former subject consult any of the standard physiologies, and the author's Elements of Physiological Psychology, i., chaps. iv. and vii., and ii., chaps. i., ii., ix., and x. Wundt: Physiolog. Psychologie (3d ed.), I., Absch. i., chaps. 4 and 5, and II., Absch. v. For the latter, the same works; Ladd: op. cit., ii., chap. viii. Wundt: II., Absch. iv.; and the collateral literature referred to in these treatises. Among the monographs treating of primary Conation and Will are the following: Spitta: Die Willensbestimmungen, etc. Chmielowski: Die organischen Bestimmungen d. Entstehung d. Wille. Mach.: Grundlinien d. Lehre von d. Bewegungsempfindungen. Schneider: Der menschliche Wille, i.–x. Preyer: The Mind of the Child, I., Second Part. Münsterberg: Die Willenshandlung. O. Külpe: Die Lehre von Willen, etc. Philosoph. Stud., v., pp. 179 ff. and 381 ff. Féré: Sensation et Mouvement. Of value are also works on Physiognomy such as Warner, Physical Expression, and Löwenfeld, Physiognomik und Mimik.]

CHAPTER XII.

THE REPRESENTATIVE IMAGE OR "IDEA"

It was formerly one of the commonplaces of psychology to point out the dependence of all our mental development upon the faculty of memory. And, indeed, it is self-evident that only as psychical states may be consciously connected together can the subject of the states come to know anything either about himself or about things. Modern psychology has been wont, on the other hand, to deny that memory should be spoken of as a "faculty" at all; it has rather emphasized the continuity of psychical life as a mere mechanism of sensations and of images representative of past sensations. In what sense memory is a faculty, and in what relation it stands to the development of all faculty, will be considered later on. Our present task is scientifically to describe the nature, conditions, and relation to its so-called "original," of that elementary form of psychosis which is emphasized in memory. For lack of a better term, we shall use, indifferently, for this elementary psychosis, the words "mental image" and "idea."[1] Our study of this psychic element, in a fundamental way, will enable us subsequently to see how far all exercise and development of mental faculty depends upon the nature and laws of the recurrence, fusion, and reciprocal influence of ideas. In other words, in all perception and self-consciousness, in all complex forms of emotion, desire, and volition, as well as in memory and imagination, strictly so called, ideation, or mental-imaging, plays an important part. We must "ideate" in order to know, to feel, to will; *without mental images, or ideas, the organization and continuity in development of mental life is absolutely impossible.*

Here, however, a caution is needed, even at the risk of seemingly needless repetition. We do not espouse that theory of mental life which accounts for it all as the result of "fusions" and "conflicts" of ideas; or as the resultant of "aggregations"

[1] Sir William Hamilton says of the word "idea:" "In England Locke may be said to have been the first who naturalized the term in its Cartesian universality. When, in common language, employed by Milton and Dryden, after Descartes, as before him by Sidney, Spenser, Shakespeare, Hooker, etc., the meaning is Platonic."

and "agglomerations" of sensations and fainter images of sensations. We are as far from agreeing with Herbart as we are from accepting the theories of Mr. Spencer on these points. It has already been sufficiently explained what is meant by an "element" of mental life, by the "fusion" of such elements, and by their "reciprocal influence." Simple unconnected mental images of sensations, feelings, or conations, no more exist in consciousness, as it offers its phenomena to our scientific study, than do such sensations, feelings, conations themselves. And ideation-processes are no more "factors" or "elements" of complex psychoses, in the sense of being distinct entities (like the atoms and molecules of physical masses) than are any other of the fundamental psychical processes. But the introspective and experimental analysis of modern psychology cannot be abandoned, because, in spite of repeated explanations, some readers will probably persist in misunderstanding our necessarily figurative terms.

The Nature of the "mental Image," or "idea," can best be understood by carefully studying what takes place in consciousness as any particular one of the more simple psychoses loses its vivid and realistic character—as it "fades away" (so we are pertinently accustomed to say) in, and then from consciousness. For this purpose either one of the three fundamental forms of mental life may be emphasized. Thus we may speak of the mental image of a sensation, the mental image of a feeling, the mental image of a conation, or act of will. The conditions under which these different elementary processes are allowed to fade away, and so pass into the idea corresponding to each (to "ideate" themselves, as it were) may be almost indefinitely varied. Thus the basis of a somewhat accurate scientific treatment of the nature and conditions of ideation in general may be laid. These earliest "residua," or first-occurring traces in consciousness of the actual processes of sensation, feeling, or conation, may be called "primary images," or "after-images," corresponding to the processes they more or less ideally represent. They might also be called "ideas of first intention."

In all study of the nature of the mental image the effect of attention is most important. If we persistently attend to the sensation, feeling, or conation, it fades away and passes through the different recognizable stages of ideation much more gradually, as a rule, than it otherwise would. But if we let it "slip away," whether voluntarily or involuntarily, or if some sensation, feeling, or impulse occurs to interrupt the original impression, then this impression generally seems not to undergo the stage

of the after-image or primary idea. Speaking in vulgar but expressive fashion, one may declare: All idea of what I was just seeing, feeling, doing, is "driven out" of my head—this, when the interruption of my psychosis was especially abrupt, because of the intense or interesting character of the new psychosis.

But now the absorbing practical question may arise: Can I recall the sensation, feeling, volition, of the moment ago? This question may take either one of several suggestive forms. For example: Have I any "idea," or can I "call up" any idea, of my just previous mental state? or, What *was* it I was thinking about, or doing, an instant ago? or, Will the idea of that ever arise again in my mind? Let it be supposed, however, that this effort at recollection is successful; and that we then turn our attention to the psychosis in which it results. And now the form of our representative consciousness will probably be found to differ, in several respects, from that of the so-called after-image, or idea of first intention. Figuratively speaking still, it may be said to have less intensity as an element of the complex mental state, less life-likeness, less "sensuous" character, as it were. If now, once more, a considerable period has elapsed since the experience of the sensation, feeling, or volition, whose image we desire to recall, such image, on appearance, will probably have lost still further in the same qualities of intensity, life-likeness, etc., as compared both with the original experience and also with its memory-image, while as yet this image was fresh.

It appears, then, that the immediately discernible nature of our ideas differs considerably, in dependence upon two very important sets of considerations. These are, first, certain relations of likeness, or unlikeness, to the so-called "originals," whose representatives they are said to be; and, second, upon the amount of time which has elapsed between the original psychosis and the occurrence in consciousness of these representatives.

Here, however, an important further distinction must be made. In this chapter we are to speak of the relation of ideas, as representative ("images *of*," etc.), to their original sensations, feelings, and volitions; and also of the effect which the lapse of time appears to have upon this relation, and so upon the nature of the ideas; but the discussion of these subjects is only preparatory to treating of the "consciousness of relation" and the "consciousness of time." These more complex forms of consciousness involve a high degree of development of several so-called

faculties—of intellect, self-consciousness, and of voluntary and recognitive reminiscence. The mechanism of ideation must be understood, however, in order to understand all these faculties, and indeed the possibility of any continuity or continuous development of the psychical life.

§ 1. Certain fundamental truths may be learned even from the terms employed to express our simplest experiences in the way of ideation. The noun *imago* in Latin might be applied to a "mask," an "apparition," a "ghost" or "phantom," and hence a something which is recognizably *like*, but really *is not*, something else. The adjective "representative" only adds emphasis, therefore, to a notion contained in the noun itself. The word "image" is obviously intended chiefly for, and is primarily applicable to, our *visual* experience. We *see* images, and think of, or remember, the objects which they represent. But in psychological language, however rough the terminology may seem, it is as necessary and appropriate to inquire concerning the possibility and nature of "images" of the skin, muscles, ear, tongue, etc., as of the eye. Strong objections may be made to the use of the word "idea" as the equivalent of the term representative image. And in the history of psychological and philosophical language few words have had a greater variety of meanings or more varied and mischievous abuse than this word. Etymologically it is the equivalent in Greek (εἶδος) of the Latin *species*. For whatever other uses than this the English word idea may be demanded, it can scarcely be spared from this use. By an idea, then, we shall now understand a representative image in general, whether it be a memory-image or an image of the imagination. In this way an entire, much-needed set of psychological terms can be consistently employed; such as "ideation," to "ideate," etc. The relations of the idea to the concept and the difference in different ideas considered as elements of memory, or of imagination, or even of perception and thought, will be discussed later on.

The words image and idea suggest that the psychical processes and products to which they correspond are both like and unlike the originals which they are said to represent. This fact is popularly expressed by saying that the former is the "image of," or "idea of," the latter; or that every correct image, or true idea, is *like* that which it represents. But, on the other hand, it is assumed that images, or ideas of sensations, feelings, conations, are not really (that is, they are in some respects, at least, *unlike*) the sensations, feelings, conations, which they represent. Thus the relations between the objects of memory, imagination, or thought, and those of perception and self-consciousness, although far more complex than this language indicates, depend, in part, upon the relations of likeness and unlikeness between the "simple ideas" and their so-called "originals."

§ 2. The sensations of all the different senses have their corresponding after-images. This fact has already been explained, especially in the case of the eye, as dependent upon physiological conditions (p. 127). Any excitement of the organism, whether peripheral or central, lasts for a time after the stimulus has been removed; the state of excitement reverberates in the central organ after the end-organ has quieted down. But for purposes of present experiment let one study the fading away in consciousness of any

sensation, while attention is directed strictly to the changes of quality, intensity, etc., which thus take place. For example, let one fixate the retinal image of a candle, or a colored spot, and then close the eyes and note what follows. The immediate after-image is as clearly a sensation (as respects intensity, life-likeness, and objective reference) as was the original experience. For this reason the term "after-*sensations*" has been—not improperly—proposed for these phenomena. But soon, and usually in an intermittent way, this after-image, with its strongly sensuous coloring, disappears; and it is found impossible, even with persistent striving, to make it reappear in precisely the same form. We may either be compelled to content ourselves with stating in language *what sort* of a sensation was formerly had; or we may be able to reproduce in the concrete form of an image, but with fainter intensity and less of sensuous life-likeness, the *representative of* the actual sensation. These two forms of reproduction should be carefully distinguished; it is of the latter only we are treating at the present time. It is the latter only that can be called a "copy," or representative, of the original simple impression, in any true meaning of the words.

What is true of after-images and ideas of first intention, resulting from visual impressions, is also true, though less obviously, of the impressions of the other senses. Tastes often linger in the mouth, and smells in the nostrils, so that we are scarcely able to tell — it is said — whether we "really do" taste and smell, or only "imagine" that we taste and smell. Sensations of sound leave after-images that ordinarily disappear more promptly. But even in their case the distinction between "sensing" and "imaging" sounds cannot always be drawn with certainty. For example, the violinist may make us *hear* the dying-away of the note in a *diminuendo* passage by the trick of continuing to draw his bow over the string without actually touching it. Here the fainter and fainter auditory sensation is replaced by the image without our being able to detect the transition between the two. Intense sensations of pressure, by careful attention, may have their after-images delayed for a time, and seem to fade away somewhat after the manner of visual after-images. In the case of sensations of temperature, our uncertainty about the character of the objective stimulus makes it always difficult to distinguish between sensations and images of sensations. The laboratory trick already referred to (p. 76), shows that the imaging of a low intensity of the sensation of heat may easily be mistaken for the sensation itself.

§ 3. The effect of time upon the fading away of the primary image may be made the subject of experimental investigation. In fact, there are scores of sensations, feelings, and volitions, whose after-images fade quickly out of consciousness, perhaps never to recur; but which are capable of being detected if we only search for them in time. For example, let one who is absorbed in reading, reflection, or conversation, be questioned: What were you just doing? or, What was I just doing? or, What just happened in the room? (supposing such person has been twirling his moustache; or you have reached over the table for a pen; or the clock has struck); and if the question follows within 2 to 10 sec., of the event, it can be answered correctly. If, however, the question comes later than this, the primary image will have faded beyond recall. Thus Weber found that the primary mem-

ory-image of weights sank rapidly the first 10 sec.; and Lehmann found that a shade of gray could be recognized with certainty only as long as the interval did not exceed 60 sec. Another observer[1] placed the greatest accuracy for memory of the pitch of tones (corresponding, presumably, to the most vivid and life-like condition of the primary image) after an interval of about ten seconds from the sensation. From this point the curve of accuracy of the image fell off pretty regularly until the interval reached between 10 and 20 sec.; then it ceased to fall off, and still further beyond fell off again more rapidly, with increasing time. Another observer,[2] by studying the effect of time on his memory of series of "nonsense syllables," learned by heart, found that the process of forgetting, for longer intervals, is rapid at first and then slower. After one hour half the original amount of work must be done in order to relearn the same series; after eight hours, $\frac{2}{3}$ of the same work. But even after twenty-four hours the memory-image retained $\frac{1}{3}$ its strength; after six days, $\frac{1}{4}$; after thirty days, $\frac{1}{5}$. This observer inferred this law for the fading of the memory-image: "The ratio of what is retained to what is forgotten is inversely as the logarithm of the time."

On the other hand, in certain cases the memory-image, with all the intensity and sensuous life-likeness belonging to its most "primary" character, lingers for a long time, or persistently reappears in consciousness. Microscopists, after prolonged work with the microscope, sometimes find that the images of the objects seen in its focus live for hours, or even days, in the "*fundus* of the eye." Musicians often hear the sounds made by their pupils for hours after each lesson. Dr. Moos tells of a patient whose acoustic images persisted with the intensity of sensations for fifteen days after a musical *séance*. After working for days together on brain preparations with fine gauze over them, M. Baillarger would all at once see the gauze covering other objects in the field of perception. Another worker in science, when promenading the streets of Paris, frequently saw the images of the preparations with which he had been busy projected on surrounding objects.

§ 4. A study of the reverse relation between sensations and their images seems to lead us to the same general truth. Starting from the sensation we may trace its fading into the more and more "ideal" form of the primary or secondary mental image. But starting from the "purest" of mental images we may, by increase of intensity and life-likeness, render it indistinguishable from the sensation. Thus the different degrees of temporary or persistent hallucination originate. In sleep and in hypnotic conditions the mental image regularly has the sensuous and objective character of the original from which it is said to be derived. In dreams, it is true that our mental imagery often takes its rise from exaggeration and misinterpretation of actual sensations. Thus one dreamer "imagined" the torture of a stake driven through his foot by burglars, because he "sensed" a feather between his toes; another imagined that the horse of the *diligence* in which he was travelling had fallen and lay panting, because he was himself enduring, in sleep, the disagreeable sensations of asthma. But even such phenomena

[1] H. K. Wolfe: Ueber das Tongedächtniss, Philosoph. Studien, iii., Heft 4.
[2] Ebbinghaus: Ueber das Gedächtniss, p. 85 f. Leipsig, 1885.

as these show how evanescent is the distinction between the sensation and its idea.

Again, it has been pointed out[1] that different persons have different degrees of success in the imaging of different classes of sensations. Some are more successful than others with auditory sensations, some with tactile and muscular sensations; most are most successful with visual sensations. Defects corresponding to the different characteristic excellences are frequent enough. Thus one man finds it nearly impossible to visualize distinctly the face of an absent friend; while a melody to which he has listened the evening before will be sounding in his brain the live-long day. Another can see before him the vivid pictures of those long dead; but, to save his life, could scarcely recall the tune he has just heard sung or played. Stumpf tells of a young aspirant to learn the violin who was unable to play correctly, not because—as was at first supposed—he had "no ear" for pitch, but because he had no ideas of the tactual and muscular order, so as to control accurately his fingers in spacing, or the movements of his bow-arm. It is only in some minds that sweet smells and tastes linger. Some, however, quickly pass from the idea of certain smells or tastes, suggested by the bare mention of the substances which occasion them, into a condition of nausea and vomiting, or of pleasantly quickened vitality—so effectively life-like are their mental images of these sensations.

In the case of certain individuals and in certain abnormal states of brain and mind, ideas have all the intensity, life-likeness, and objectivity of powerful sensations themselves. Some have the power, at will, so to create the image of a remembered object of sight as to present it to themselves with the clearness of outline, strength of coloring, and covering power of actual percepts. These rare cases are similar to what is more frequent among hypnotic subjects. Every student of insanity knows how "fixed ideas" tend to objectify themselves until they become indistinguishable by the subject of them from the most undeniable perceptions. Angelic or demoniac voices, at first fitfully imagined, come to be persistently heard addressing the ear; forms of ideal origin, and, at first, of occasional appearance, at last accompany the willing or unwilling vision everywhere. Hallucinations of smell and taste, but above all of the skin and internal organs, are closely connected with various forms of insanity. In all these matters the range of experience is very great; and an almost unbroken continuity of cases, with slight variations in degree for each form of sensation and ideation, can be made out. The dulness and slowness of some persons, of even a good degree of intelligence, in the process of image-making, is astonishing. But some, like the man of whom Bonnet tells us, see people, birds, carriages, houses, etc., without external cause; and there is the well-known case of Göthe, who, when he closed his eyes and bent his head, could plainly see a flower, with other flowers growing out of it, as long as he chose. The religious ecstatic—like Benvenuto Cellini, who saw, in answer to prayer, the disk of the sun in his subterranean prison, and the artistic devotee—like the English painter who painted portraits from sitters placed by his imagination in the chairs before him, or the immortal but deaf Beethoven, who constructed by ideation the harmonies he heard, are examples

[1] Especially by Galton in his Inquiry into Human Faculty, and by many other investigators.

of this power. But between them and the poorest adept at image-making lie all degrees of efficiency. We conclude, then, that *although sensations and their representative images, as such, do not differ simply in sensuous intensity, they do differ only in degree of the same essential characteristics.* What, besides intensity, such characteristics are, will soon be made apparent. Things perceived and things remembered or imagined undoubtedly differ in an indefinite number of ways; and yet these greater and more complex differences are largely based upon the primary differences between sensations and ideas.

The Physiological Conditions of the occurrence and recurrence of mental Images are to be found in certain general biological laws, as well as also in specific qualities of the nervous substance of the cerebral centers. Indeed, the molecular changes of even non-living bodies, in certain instances, seem to furnish an analogy to these physiological changes. For in non-living bodies systems of molecules may receive a certain "*set*" which determines the nature of their entire future behavior toward each other; and by repeated actions of a certain kind they, apparently, acquire so-called "tendencies" to similar actions in the future. But this imperfect analogy of a physical sort only in a small degree accounts for what has sometimes been called the "memory" of living tissues. Here the fundamental laws of metabolism (or change of the substance entering into any living structure, as old particles are excreted and new ones absorbed), of cell-propagation, of nutrition, and growth, must be taken into account. The preservation and development of the life of every organ, and so of every complex organism with its numerous interacting organs, involve these laws; they may even be extended to the individual cell.

In general, then, the physiology of living bodies provides that there shall be continuity in development; that in all present changes the past stages of development and the previous forms of functioning shall be taken into the account. In a word, every living structure carries in itself, in some sort, the history of what has happened to it up to the present time, and of all that it has done under the influence of the different forms of stimuli which have acted upon it. The more complex the structure is, and the more varied its experience in the past has been, the more of developed capacity it possesses to meet the varied demands for further activities. But the more of solidarity it has attained, and the more its activities have been directed into, and repeated in, certain definite lines, the stronger is its tendency to react, whenever new similar stimulation occurs, in the customary ways. Speaking figuratively: It "remembers" what

it has done; habit rules; it does each time what it remembers as "right" to do.

Every portion of the nervous system falls under the physiological laws which give conditions to this so-called "organic memory." This is true of the ganglionic nerve-centers scattered throughout the internal cavities of the trunk, of the nervous portions of the end-organs (such as the retina of the eye), of the spinal cord with its various centers for the performance of complicated reflex activities, and of the lower organs of the brain. But it is pre-eminently true of the cerebral hemispheres, where the so-called "psychic" nerve-cells and nerve-fibers are found. This structure is, of all molecular structures, by far the most complicated and sensitive. But the life of every brain has a history; the history of every brain is a different history, and every brain carries its history written within itself. Since, then, it falls under the principles of habit, growth, tendency, etc., this collection of psychic nerve-cells and nerve-fibers has, in the highest degree, all the characteristics of the so-called organic memory. And it is these characteristics which furnish the physiological conditions of the occurrence and the recurrence of the mental image.

§ 5. The practice of photography depends upon the fact that a plate of dry collodion, after being exposed for an instant to the sun's rays, retains for weeks in the darkness the effects of the indescribably delicate changes which it then underwent. Every impression taken from it is an expression of this truth; only thus does the impression become the image of the object photographed. A French writer[1] has shown that "latent images" may be "to some extent garnered up in a sheet of paper," kept there for a long time, and then revealed at the call of certain reagents. Even a good old Cremona violin has the history of its past, in the form of an "inorganic memory," stored up in the molecular alterations of its woody fiber. When touched again it reproduces the tones it has been trained to produce.

These inorganic tendencies of a molecular kind, however, only faintly foreshadow the organic; it is in the nervous system that all this effect of habitual forms of activity becomes most pronounced. The nerve-cells, like all cells, have the power of nourishing themselves and of propagating their kind. The nutrition brought to them by the blood is used for the enlargement of the cell, under the principle that each cell builds itself in accordance with the molecular character it has already attained. Each cell also may be held to propagate itself under the laws of heredity. But at the same time its internal molecular alteration and the activity of the connected cells are mutually interdependent. Thus what is called the "organic memory"—or tendency to reaction and further development according to certain lines dependent upon past action and past development—is gained for

[1] Niepce de Saint-Victor: Compt. rend. de l'Académie des Sciences, xlv., p. 811; and xlvi., p. 448.

each portion of the nervous system. Retention and reproduction on the physical side, or as physiological conditions not only of the occurrence and recurrence, but also of the association, of mental images, are thus provided for.[1]

The foregoing considerations apply to the spinal cord and to the lower parts of the brain. Both experiment and observation show that these nervous structures possess at birth certain aptitudes and tendencies connected with the habits, physiological and psychical, of race, breed, parentage, etc. But these organs, whether in the case of the new-born puppy or of the new-born infant, cannot at first do some things which they can learn to do;—using still the same convenient figure of speech, they need to acquire, and can acquire, an organic memory on the basis of the experience of the individual. As we have elsewhere observed: "Each element of the nervous system, especially in the more significant of its central organs, may be considered as a minute area intersected by an indefinite number of curves of different directions and orders; thus a molecular commotion in any such area may, according to its character and point of greatest intensity, run out into the system along any one of these many curves." In every such small fragment "the whole curve slumbers." But pre-eminently true is all this of the nervous elements of the cerebral centers, where the so-called psychic nerve-cells are. Of the effect of stimulation upon them one writer[2] affirms that *these* cells never return after their excitation to their original condition. Such a cell "has been modified in a permanent manner by the act of stimulation; and this modification can be effaced only by the death of the cell. Each excitation has, so to speak, created a new cell different from the first."

The recurrence of any memory-image is, therefore, significant of the continuance of the effects of previous reactions to stimulation, in the shape of a tendency of the same nervous substance to react in ways similar to those in which it has formerly acted. But no nervous element, and especially no so-called psychic nervous element, acts apart from the action of others. Hence *the mechanism of representative images, as they occur and recur in connection with each other, has its physiological conditions in certain "dynamical associations" amongst the "psychic" nervous elements.* And the spontaneous recurrence of *some* of these images *rather than* others, as started by this or that external or internal stimulation, depends upon the character, number, and strength, of the "dynamical associations" which make up the "organic memory," so called, of the nervous organism concerned in the whole process of ideation.

§ 6. It is assumed that the *cortical centers concerned in sensation and in ideation are the same, for the same objects at least;* and this assumption is confirmed by all which we know of the physiology of the brain. It must be remembered, however, that since neither sensations nor ideas occur in isolation, in both processes—however simple we may try to make our experimental tests—considerable areas of the nervous substance are always involved. It has been claimed by some writers of late that "sensation and idea depend upon different cortical elements;" and the term "memory-cell"

[1] See the Vortrag of E. Hering, Ueber das Gedächtniss als eine allgemeine Function d. organisirten Materie. Wien, 1876. Compare Ribot, Diseases of Memory.

[2] Richet: Les Origines et les Modalités de la Mémoire, Rev. Philosoph., June, 1886.

has been invented as a title for such elements as are concerned in reproduction solely. But even the experiments with animals upon which these claims rely, prove, rather, in so far as they can be relied upon at all, the very opposite of the claims. For the dog which is affected with "psychical blindness," or "psychical deafness," as a result of the removal of certain parts of the cerebral substance, has lost *psychical* character alike from both forms of conscious modification. Its sensation-complexes, or rather perceptions, are as much modified, or lost, as are its corresponding ideas. We conclude, then, that every organ, and every element of every organ, falls under the same biological laws. Every organ, and every element of every organ—so far as we can appropriately use such a term for a physical mechanism—has its own organic memory. And the sum-total of these modifications and dynamical associations, which have resulted from the past experience of the system of central organs, constitutes the system of physiological conditions in which our psychical processes of ideation have their physical basis.

We now resume discussion of the Nature of the Representative Image as related to its "original," with new light derived from our conclusions respecting the physiological conditions of both these forms of psychical life. The cerebral processes which underlie sensation are *like* those which underlie image-making, in that similar changes in the same connected groups of nervous elements form the physical basis for both kinds of psychosis. But they are *unlike*, in that the peripherally initiated processes predominate in sensation; and in image-making, the centrally initiated processes predominate. This difference, or unlikeness, however, is not absolute. Between the "purest" sensation and the "purest" idea of that sensation an unbroken chain of psychophysical processes may intervene to bridge over this difference. By increasing the intensity of revived central processes, more or less of hallucination may take place; and, finally, the mental image may become so like the sensations which it represents as to be with difficulty, or not at all, distinguished from them.

A thorough re-examination of the data of consciousness now confirms the suggestions derived from the most probable results of physiological psychology. In consciousness the mental image is known to be more or less like and unlike its sensation-original, as respects: (1) intensity; (2) life-likeness, or fulness of sensuous content; and so (3) objective characteristics. In saying this it is assumed that mental images have different degrees of intensity, corresponding more or less nearly to the intensity, as sensational, of the originals which they represent. It is also assumed that ideas are not *merely* fainter copies of sensations, but that qualitative as well as quantitative differences may be recognized when we compare the two. On the whole matter, then, we find consciousness agreeing in some sort with, and yet,

in some sort, differing from both the extreme views taught by opposing schools of psychologists. Some writers assert that the *only* difference between sensations and their representative images is a difference in intensity or vivacity. With Hume and the earlier English psychologists, generally, an "idea" is a "fainter copy" of its sensation. Bain[1] also seems to deny all qualitative difference between the sensation and its memory-image. But other writers affirm that the difference between the sensation and the idea is "above all a qualitative difference;" and even deny all intensity, and so all possibility of difference in intensity, as characteristic of different ideas. As says Ziehen:[2] "The *sensual* vivacity characteristic of every sensation does not belong *at all* to the idea, not even in a diminished intensity." Both these extreme views are equally correct in what they affirm, and wrong in what they deny. For the differences and likenesses of sensations and ideas, as factors of conscious life, concern both the intensity and the complex quality of the two.

Our consciousness proves that we immediately recognize a vast amount of difference in the intensity of our different ideas. Let any good visualizer, for example, undertake to revive some particularly vivid and recent visual sensation-complexes, such as a new color, a bright scene, an impressive face. By persistent attention the complex memory of the percept may be made to grow not only in fulness of content, but also in intensity; the particular visual elements may be made to improve until the bright color, or the lineaments of the face, are *seen*—in "the mind's eye"—anew. Thus, too, one who is successful in auditory image-making may find no great difficulty in causing to sound clearly in "the mind's ear" the cheerful chirrup of the wooden clogs on the concrete pavement of the station, or the silver-toned booming of the temple bells, in Japan; the weird minor strains of the venders of goods upon the streets in Mexico; the sounds of the ship in a storm, during a recent passage of the Atlantic, etc. Few are so fortunate as not frequently to recall with a cruel sensuous vividness their skin-sensations in the last fit of ague, or the feeling of the dentist's instruments when the teeth were recently plugged? A striking but common fact affords indubitable evidence in the same line. On trying to recall any particular sensuous experience one often finds one's self baffled, *just because* the ideas lack for a time this characteristic of intensity which is fairly representative of the intensity of their sensation-originals. Then one *knows* perfectly well what

[1] The Senses and the Intellect, pp. 338 f. and 462 f.
[2] Introduction to Physiological Psychology, p. 152.

it is one wishes vividly to recall; it is, for example, the face of a friend, A. B., or an air in the opera, M., or the "feel" of a particular texture of cloth or metal; but one cannot *image* what one wishes. But all at once there starts out in consciousness a vivid picture of the sight, the sound, the "feel," one seeks. Our conception, as a thought, is no richer in content than it was a moment before; but we see, hear, or feel the concrete thing we sought, because our mental imaging has gained the requisite intensity.

In comparing sensations and ideas as respects "life-likeness" it is necessary to remember that neither sensations nor ideas are ever experienced in so-called "purity" or isolation. The sensations we have, and therefore, of course, the sensations we recall in the form of representative images, always have a varied richness of sensuous content. It is in the possession of this that their "life" consists. *The "life-likeness" of the idea is therefore dependent upon its possessing a corresponding richness of content; and that idea is the most "life-like" representative of any sensation-experience which most nearly reproduces the compound characteristics of its original.* If, for example, I wish to have a life-like mental picture of any particular smell or taste, I can attain this only by reproducing, as far as possible, all the elements which entered into the original sensation-complex. For this purpose I imagine myself tasting or sniffing at the object anew; I roll the imaginary morsel again upon my tongue, or take imaginary whiffs of it into my nostrils. If I wish a life-like visual image, I imagine myself looking at the object again, tracing its outline with a moving eye, or actively comparing its color with its background, or with other similar or contrasted colors. The new life-growth, in order to be *like* the old life-growth, must possess the same concrete fulness of life.

Closely connected with the requirement just mentioned is another. All our sensation-complexes have an "attachment" of feeling which is likely, if not certain, to be of a pleasurable or painful tone. Now it is our interesting sensations which are most likely to recur, in the form of mental images, within the stream of conscious life. But unless the mental images have some attachment of feeling corresponding to that of their originals, they are lacking in one of the most essential features of life-likeness. *Ideas are*, indeed—other things being equal—*like sensations according to the amount of similar feeling which accompanies them.* But, further, we have seen that in all psychical development sensory processes are linked in with motor processes. "Sensory-motor" is the compound term which describes the entire experience resulting from the stimulation of the

organs of sense. Now, therefore, the complete life-likeness—the total sensuous life of like character—of every idea is dependent upon its being connected with motor activities similar to those with which the original sensation-experience was connected. Only as the idea secures the appropriate motor reaction can it attain the fulness of life which belonged to the original experience which it represents. The character of their dependence on will is, therefore, an important difference between sensations and ideas. And it is chiefly the difference between the sensuous richness of content, with its accompaniment of feeling and voluntary or involuntary motor reaction, which our sensations have, and the relative meagreness in these respects of most of our ideas, which makes the "objectivity" of the former so much superior to that of the latter. In all ordinary experience, mental images are far less intense in quantity, less varied and rich in qualitative distinctions, of less pronounced tone of feeling, and inferior in motor result, as compared with the sensations which they represent. Therefore, though our ideas are like our sensations, they are also rather unlike them; we have no difficulty in distinguishing the two. Thus the world of sensuous reality is not confused with the occurrence and recurrence of ideas. But in all these respects ideas may so approach sensations as that the distinctions fade away, and finally cease altogether to be possible.

§ 7. It is customary for those who deny that ideas have intensity to use language like that of Lotze: "The idea of the brightest radiance does not shine, that of the intensest noise does not sound, that of the greatest torture produces no pain," etc.[1] Thus a recent author (Ziehen) declares: "The ideas of the slightest rustling and of the loudest thunder exhibit no difference in intensity whatever. . . . The *idea* of the sun has nothing of the brightness or splendor of colors which characterize the *real* sun," etc. Now we might go on to say, in our eagerness to distinguish sensations and ideas —the "idea" of green *is* not green, the "idea" of blue *is* not blue, etc.; but from the psychological point of view nothing could well be more misleading than all this. It is perfectly true that I can think of the sun or of the thunder or can say over these words ("sun" or "thunder") with the most perfect attention to what I am saying, and then can think of a candle or a whisper, and can say over the words "candle" or "whisper," without noticing any diminution in the intensity of my visual or auditory ideas. But this simply proves that I can *think about* thunder and whispers, or the sun and a candle, without having any mental images at all which concretely represent the sensations I have when I actually hear thunder or whispering, or when I actually see the sun or a candle. Probably, also, I never have any auditory image which rivals in intensity the sensations of the thunder; nor can I, without the meditation and abnormal nervous condition of a Benvenuto Cellini, ideate so intensely as to have the vision in midnight darkness

[1] Outlines of Psychology, p. 28. Compare Microcosmus, I., p. 203 f.

of a mid-day sun. But all this has no bearing whatever on the question whether concrete representative images (and not "thoughts about" sensations) differ in intensity or not.

Let anyone who doubts ask himself in what respect his enforced auditory reproduction of the shrieks and groans he heard in the railroad accident of yesterday differs from his memory of the sounds of an hour ago; or, why it is that, after a long sea-voyage, he is compelled to antagonize the lingering motor images of the sea by sights which he knows to be really of the land. The trifling involved in some of the objections, like those of Lotze and Ziehen, may be set aside by reminding ourselves that, strictly speaking, the sensation *of* bright green *is* no more a bright green sensation, than the faint idea of bright green is a faint green idea.

§ 8. There is truth in the view of Volkmann[1] and the other Herbartians who maintain that "sensation and reproduction are only changing predicates of the same psychical events, designations of different periods in the history of the same mental process (*Vorstellung*)." Thus it is argued that by *sensation* we mean the "presentation" from its first development to its first obscuration; by *reproduction*, the "presentation" from its return into consciousness till its subsequent obscuration. But—so these writers go on to say—reproduction leaves the quality of the "presentation" unchanged. Its weakened quantity is, however, so characteristic that, if we compare the reproduced idea with present sensations, we have no difficulty, as a rule, in distinguishing the former from the latter. On the contrary, we hold, while admitting the characteristic difference in intensity, that reproduced ideas differ from their originals, and from each other, in respect also of the fulness with which all the allied elements are reproduced. It is largely this difference which gives them more or less of "life-likeness," of *vraisemblance*, of correspondence to the concrete and rich sensuousness of their originals. Ideas are ordinarily more schematic, more in bare outline, as it were, more meagre of content, than are the sensation-complexes which they represent.

But the difference between sensation and idea is also largely one of relation to feeling and volition, with the accompaniment of motor activity. It is the "tone" of the sensation, consisting in the excitement of feeling as dependent upon the excitement of the bodily organism, which gives life-likeness to the sensation; its representative image must have likeness of tone in order to be a life-like idea. And here the ineptness of Lotze's saying, that "the idea of the greatest torture produces no pain" becomes apparent. If by the idea of a painful sensation we mean simply the idea of a sensation, thought of as having been painful, or if we mean the thought about certain circumstances in which painful sensations are alleged to have occurred, etc.—then Lotze's statement is true. But the representative image of a painful sensation, imaged *as painful*, is nothing but the image of a particular sensation reproduced with a much weakened but genuine accompaniment of characteristic painful feeling. And the world is full of men and women who cannot see sights, or hear sounds, or read words, or think thoughts, that remind them of their past painful sensations, without having the old pains reproduced as a fitting accompaniment of the revival of the ideas.

§ 9. Connected with the life-likeness of the idea and with its relation to

[1] Lehrbuch d. Psychologie, I., p. 459 f.

the sensory-motor characteristic of its original, is its usually unstable and irregular existence. The excitement which external stimuli furnish to the end-organs of sense is comparatively steady; it can be relied upon not to change, or to change, if at all, in calculable ways. The muscular sensations excited in connection with ideational attention differ from those accompanying sensational attention. In ideation generally our localization is vague, as the mental field of vision, or of touch, or of sound, is itself vague, indefinite, and fitfully changeful in outline. All these differences correspond to the diminished objectivity of ideas; they secure the possibility that we shall not always be imaging things and occurrences in such way as to mistake them for real things and occurrences of sense. Thus the memory-images which arise when the after-sensations have faded away, although localized in some definite region of external space, do not ordinarily move, with movement of the eyes, as these after-sensations themselves do. But true percepts, being dependent for their fixed position on the external origin of the stimulus which acts upon the end-organs of sense, remain motionless when our eyes move. Moreover, visual percepts are doubled by pressing on the eyeball, and they have covering power; but after-images and ideas differ ordinarily from percepts in both these respects.

§ 10. Strictly speaking, however, the conscious difference between sensations and ideas consists more in a distinction of total state (state of perception as compared with state of memory or state of imagination) than of mere sensation-process and ideation-process. And so Dr. Ward [1] is right in maintaining that we cannot have a reproduced image of a simple visual or tactual sensation (*e.g.*, red); but can only have an image of something seen or felt, (some red thing or red form). In other words, *we ideate percepts and not unlocalized sensations or abstract and disconnected movements.* We represent the whole sensation-process, in which peripherally excited elements chiefly preponderated, by a process in which similar, centrally excited elements chiefly preponderate. Hence a complex relation of both likeness and unlikeness is possible between our sensation-experiences and our ideas; and in this relation ideo-motor elements bear an important part. For the connection between reproduced image and movement is similar to that between sensation and movement. In the case of ideation, however, the movement is usually relatively inchoate and feeble, and therefore only imperfectly representative of the movement involved in all perception.[2]

§ 11. The life-likeness of the ideas of different sensations, as dependent upon the character of the sensations reproduced, and upon lapse of time, differs very greatly. In general, mental images of muscular sensations disappear abruptly from consciousness — like the loss of the memory of a

[1] Article in the Encyc. Brit. on Psychology, p. 57.

[2] Fechner holds (Elemente der Psychophysik, ii., p. 469 f.) that memory-images arise (1) in company with the feeling of a less or greater degree of spontaneity; (2) at a still longer time after the sensuous impressions have passed away; and (3) can, in part involuntarily by association of ideas, and in part voluntarily, be called forth or dismissed and altered. But "after-sensations" occur (1) in company with a feeling of receptivity; (2) immediately after the sensuous impressions; and (3) independently of will and association of ideas. These distinctions, however, are all matters of degree and serve to put an indefinite number of experiences—"after-sensations," primary memory-images, more or less intense and life-like ideas—in between the sensation and its most idealized representative. Another writer considers it a matter of universal consent that it is the feeling "des lebendigen oder organischen Ergriffenseins," through which the weakest sensation is distinguished from the strongest recollection.—Horwicz, Psycholog. Analysen, i., p. 298; comp. p. 311.

name. And yet by their presence in all our ideas of the spatial qualities, relations, and changes in space, of material bodies, they are of the utmost importance to the acquirement of experience and to the conduct of life. Sometimes, unbidden—like the forgotten name—they present themselves in a very lively way to our observation; in which case they are less serviceable than when less life-like. Sensations of smell and taste, on the contrary, naturally pass more slowly through the fading processes—after-sensations, primary memory-images, etc.—but are equally difficult of revival; when, however, they actually reappear, they are apt to be exceedingly life-like. The representative images of sound and sight, in all ordinary cases, admit regularly and uniformly of more nicely graded degrees of intensity, life-likeness, etc., and so of more definite resemblance to the originals from which they spring. Finally, in the case of all forms of the reproduction of sensation-experience, the constitution, habits, and psycho-physical condition of the individual are of the greatest account.

Thus far only those forms of the representative image which are referred to *sensations* as their so-called originals have been considered. This restriction was justifiable, because it is only the ideas of sensations which lend themselves readily to the most elementary discussion of the subject. If, however, we consider how our psychologically truthful popular language expresses experience, we learn that memory is by no means confined to sensations, or even to the perception of things. One can remember to-day what it was that one remembered, imagined, thought, and did yesterday, or the day, or year, before. One can imagine another person (real or imaginary) remembering, imagining, thinking, and doing, in an indefinite variety of ways. Moreover, it is not merely intellectual states and activities which may become objects of memory or of imagination, but also states of feeling and will. Indeed, a very large part of the interests, the benefits, and the dangers, of both memory and imagination consists in reproducing or artistically constructing pictures of how we ourselves and others have *felt* and *chosen*, under all manner of actual or imaginary circumstances. The question, therefore, at once presents itself as to how far we may extend our views of the nature, and relations to its original, of the representative image, so as to cover other than sensuous forms of mental life.

That memories, imaginations, thoughts, and all other similar psychical processes, should be capable of reproduction in the form of mental images, can occasion no surprise. For these processes themselves are, in their native and original character, chiefly ideation-processes. How the "idea of an idea" can arise in consciousness it is not difficult to see, the moment we admit the continuity of the stream of consciousness, under the general laws of reproduction. As respects intensity, life-likeness, con-

nection with motor activities, and so "objective reference," one idea is more like another idea than it is like its own sensuous original. One idea may then fitly represent another idea, on account of this essential similarity of nature. In fact, it is upon the basis of this possibility that any present process of ideation may represent so faithfully a similar past process of ideation in ourselves, or a similar imaginary process of ideation in another consciousness—*more faithfully*, indeed, than any idea can represent a sensation.

When, however, we consider the question, Can there be a true representative image of a feeling; and, if so, in what respect can such idea be *like* a feeling? we find ourselves upon very different ground. For if feeling is fundamentally different in kind from sensation and ideation, how can an idea represent a feeling? What sort of a psychosis could possibly be meant by "the idea *of* a feeling?" since—as we have already seen—the essential nature of feeling is *not* representable; since feeling, as such, has its nature in *being felt*. It would seem, then, that when men speak of remembering their feelings, or of imagining how others feel, they are using language in that figurative fashion which requires further analysis before it can be adopted by psychological science. It is not difficult, however, to discover the real meaning of these figures of speech. For as the psychology of feeling has plainly showed, feeling is to be regarded as a universal attachment of sensation, and, indeed, of all the most primary intellectual processes. If it is an "attachment" of the sensation or the idea, then we may conclude (and this is certainly no unmeaning play upon words), it may be "detached" from the reproduction, as idea, of its original sensation or idea. Thus, as one's ideas of the painful sensations one experienced in the hands of the dentist yesterday are much fainter and less life-like than were the sensations themselves, so the attachment of painful feeling may largely, or wholly, have disappeared. Thus ideas of exceedingly painful sensations or ideas, may themselves be notably pleasant ideas. But on the other hand, if one's ideas of past painful sensations become very vivid, and so tend to assume the characteristics of hallucinations, the old accompaniments of painful feeling are revived together with the sensations. And, indeed, the general rule is that percepts and ideas which were originally painful are reproduced as painful ideas. Thus we constantly hear it said,—in truth, life is largely made up of such experiences—"I can never see, or hear, or remember, or think of this or that, without great sadness, feeling of regret, or shame," etc. The psychological

truth here acknowledged is, that, although feelings, as such, cannot be ideated (and to speak of an idea *of* pain or pleasure, the memory *of* a sorrow or joy, is a figure of speech), *whenever past experiences of sensation or ideation which had a strong tone of feeling are reproduced, some accompaniment of similar feeling may be expected.* This new feeling, as feeling, may be more or less like, or quite unlike, the old feeling. Only new *similar* feelings can represent past feelings, and, strictly speaking, an "idea *of* a feeling" is an impossible psychosis.

In somewhat the same way do we find ourselves obliged to hold that, strictly speaking, an idea of a volition, or conative psychosis, is impossible. Here, however, there is this difference to be observed. There really exist, in the wealth of actual mental life, various kinds of feeling, as such; and these various kinds of feeling may become variously attached to sensations and ideas and to the changes of sensation- and ideation-processes. But there *is* only one kind of conation. Our purposes and choices must then be remembered, and those of others imagined, by reproducing the various sensuous and ideational factors of the complex purposes, the occasions, antecedents, results, etc., of the choices. In doing this the present conative life is occupied in the direction of attention, in the control of the train of ideas, in the expressive and supporting motor accompaniments. We do not will that very same thing ourselves, in order to remember or imagine another's past, or hypothetical act of will. Nor, in strict truth, can one conation or volition represent another. But choices and purposes and habits of will resemble each other, or differ from each other, according as the ideas, feelings, and motor results belonging to the complex psychosis are like or unlike in the different cases.

§ 12. Only a modicum of careful attention to experience is necessary to ascertain what is meant by an idea, or mental picture of a feeling. The difficulty usually experienced has been greatly increased by loose and indefinite uses of the word "idea," and by attempts to account for all the laws which control the succession of states in the stream of consciousness, under terms of the so-called "association of *ideas*." But we shall find that the succession of states in the development of mental life is far more than a recurrence of ideas under the much debated laws of association. In actual mental development emotions stir up emotions and occasion choices; and choices react on emotions—both, in ways that are only imperfectly, or not at all, accounted for by theories of the association of ideas.

[References to books treating of the topics of this chapter will be found at the close of the next chapter.]

CHAPTER XIII.

THE PROCESSES OF IDEATION

It has just been said that the composite structure of the different fields of consciousness, and the order of their succession, can be only very imperfectly explained by the laws of the so-called "association of ideas." For no field of consciousness is a mere composite of ideas; and other influences than those which belong to processes of ideation determine the order of our mental states. Nevertheless the general conditions under which ideas recur undoubtedly have a most important bearing on the entire study of mental life. Although, then, the development of mind is not wholly a matter of the mechanism of ideas, and even involuntary memory and imagination are not explained satisfactorily without admitting far more than is thus provided for; yet without an understanding of this mechanism neither memory nor imagination nor thought can be explained. It is proper, therefore, to treat of the recurrence of ideas as among the elementary processes of mental life.

In the discussion of this subject it is more than ordinarily necessary to make intelligent use of figurative language. The very word association (as well as the word idea) belongs to this kind of language. This word implies that different ideas, existing apart like real things or persons, do join themselves, or do get joined, in societies or bonds—thus "*associating*" each with the other in mutual relations of influence, and of possible concord or discord. In speaking of the "spontaneity" of ideas, of their "fusion" and "attraction" or "exclusion" of each other, of "composite" mental images, and of the process of "freeing" the ideas, etc., the legitimate services of our figures of speech seem to be pressed beyond all scientific, not to say reasonable, bounds. Yet these terms, or others likewise figurative, must be employed, unless we are prepared to resort to almost unending periphrases in the description and explanation of the real facts of mental life.

The entire treatment of this subject requires that two truths, already amply illustrated, should be kept constantly in mind.

First: *the circuit of every field of consciousness is, by the very nature of mental life, a limited affair.* Whether we consider the number of discernible objects within the grasp of clear discriminating consciousness, or the number of psychical factors which analysis shows to have had an influence in determining any particular field, our sum-total is always far from being infinite. Only a few objects fall, as constituting any one field of consciousness, within our most expansive mental grasp, even in our best estate of psychical energy. A large number of influential factors may, indeed, be suspected as co-operating to determine the complex character of some one state of consciousness; and experimental analysis may enable us to verify our suspicion as undoubted fact. For example, how many reciprocally modifying sensations, feelings, and ideas conspire to produce, in these modern times, that ennui which afflicts so many minds! And yet if by "factors" of psychoses any thing is meant of which psychology can take account (if we do not enter the region of conjectural ideas, struggling with, or furthering the interests of each other, below "the threshold of consciousness"—the Hades or Limbo of dead psychoses), the number of such factors in any state of consciousness is necessarily limited.

But, second, *the principle of relativity, in an active and effective fashion, applies to all the objects in any one field of consciousness, to all the factors in any one mental state.* We have seen this to be true, even with respect to sensations, whose quantity, quality, and laws of combination into complex psychoses, with their accompaniments of feeling and conation, are determined so largely by external stimuli. How much more is the same thing certain to be true of processes of ideation, with their relatively low degree of stability, and relatively high degree of independence of orderly and calculable influences from the world of things. It is "the lunatic, the lover, and the poet," of whom one of the greatest of psychological artists tells us, they "are of *imagination* all compact." The principle of relativity is, therefore, illustrated in a peculiar way by the modifying influence which partial ideation-processes have upon each other in the formation of any complex idea.

It follows from the foregoing two principles that every state of consciousness may be regarded as a sort of "resultant" including a certain number of partial processes of ideation or image-making, whose total character is determined by the reciprocal influence of these same partial processes. But since ideas are, in general, more meagre and schematic (less "life like" and full of content) than their originals, the construction

of any complex mental picture occurs in consciousness, part after part as it were. For example, to ideate—that is, either to recall in memory or to construct by imagination—any very complex sensation-experience, like a perception of the front of St. Peter's at Rome, or of St. Paul's in London, one has to call up fragment by fragment, as it were, a whole which was originally given with a wonderful comparative instantaneousness. Thus one may spend an hour by one's fireside piecing together (or letting suggest each other), the ideas that represent the whole of an almost momentary experience of a year ago. It is such experiences as these, falling under the two principles just announced, that have led certain psychologists unduly to emphasize the general facts concerned in the "fusion" and "sequence" of ideas, and their reciprocal influence in "attracting," "suggesting," and "excluding" each other.

§ 1. The Herbartian psychology, after profoundly influencing the entire modern science of mind, and making important contributions to that science, has lately fallen into disrepute. It has even become fashionable with those whose own views and methods owe a great debt to this same realistic movement, to speak of it as "exploded psychology," "glib Herbartian jargon," "hideously fabulous performances," and the like. And indeed its pretentious mathematics of ideas, regarded as entities existing and influencing each other both out of consciousness and in consciousness, its effort to account for the whole of mental life in terms of a theory of ideation, and its inordinate use of metaphysics in empirical science, are to be condemned. At the same time many of its suggestions and alleged laws throw a flood of light upon experience; and this is particularly true of the subject we are now about to discuss.

Interpreting figures of speech in accordance with real psychological facts, we can approve of the greater part of what the most learned of the modern disciples of Herbart[1] teaches respecting the "action and reaction of ideas." By this phrase, however, we must understand *partial psychical processes of ideation* (representative imaging), *and tendencies to such processes, combining to form a complex "field of consciousness," in accordance with the laws of conscious mental life.* With this understanding the principal truths to be considered are as follows: The point of starting is the question—Given a multiplicity of *simultaneous* ideas, what will happen in the mental life? That such a multiplicity should exist is not incompatible with the simplicity of the soul; for the latter does not require that a *multiplicity* of ideas should not exist, but that how many soever the ideas which do exist, they should not exist as disparate and without influencing each other. Now observation shows that the circle on which we can concentrate attention is a limited one, and that the very concentration of attention on one, or on a few of these ideas, involves the admitted existence of their multiplicity. This limited nature of consciousness involves the *fusion* of contemporaneous ideas into one state of

[1] Volkmann von Volkmar: Lehrbuch d. Psychologie, I. p. 393 f.

consciousness. Three cases of such fusion are possible; and, indeed, actually arise: (1) Simultaneous *like* ideas fuse in one, in the sense that concurrent partial processes of ideating flow together into one act which is directed toward the realization of like quality in a unit-state of consciousness; (2) simultaneous *heterogeneous* ideas fuse into one collective idea, in which the disparate qualities are actualized through a compound activity of ideating; (3) simultaneous *opposed* ideas inhibit each other, and then fuse; that is, they exclude from realization so much of the process of ideating them as prevents a unifying act, and then unite the rest into a collective mental state.

Another recent writer[1] expresses his view of the fundamental facts which enter into the different complex processes of ideating, in the following way: Every psychosis falls under two great principles. These are: (1) the law of systematic association, namely, the existing psychosis tends to excite and associate with itself the elements which can unite with it for a common end; (2) the law of inhibition, namely, every psychosis tends to hinder the production and development, or to cause the disappearance of, the elements which cannot be united with it for a common end. The "tendency to systematic association" is the property of all the psychic elements. This is equivalent to saying that what is already systematized in the mind tends to acquire a more complete organization.

§ 2. It is plain that the general tendency to reproduction of mental states, which rests on a basis of fundamental psycho-physical facts, and the universally limited nature of the field of consciousness, together make necessary a *selection* of objects in every complex field, and of factors in every complex state. But the very word "selection" implies the partial or total exclusion (or "inhibition," as the Herbartian terminology runs) of some, and the adoption of others. Those reproductive tendencies which actually determine every complex state, and thus get recognition in consciousness, necessarily "fuse;" that is, *the total character of every psychosis is the result of a spontaneous selective process, under the laws of that unity of consciousness which the very terms "state" or "field" of consciousness signify.* In the case of sensations we have already seen that those of smell and taste, or of tactual and muscular sort, for example, so fuse as to bring about one compound sensation-experience. In yet far more complicated and subtle ways do like ideas fuse in a compound ideation-experience. Here the analogy of a composite photograph, which is the resultant of the images of a number of individuals but does not fully represent any one, has been employed.[2] The mental equivalent of this is the so-called "collective mental image" (*Gesammtbild*). Of perception as a preparation for such mental seeing, a German writer[3] declares, in a perhaps somewhat exaggerated way: "However much it may appear simple, it is, in fact, a thousand-fold, and more than a thousand-fold composite act—which exhibits itself as simple only because its factors are absolutely homogeneous, and by a thousand-fold repeated compensatory processes are most intimately *fused*."

§ 3. But seemingly very heterogeneous mental images may become con-

[1] M. Paulhan: L'Activité mentale et les Éléments de l'Esprit, p. 17 f.
[2] Delbœuf: Le Sommeil, p. 196.
[3] Beneke: Pragmatische Psychologie, p. 162.

nected together so as simultaneously to be reproduced in the unity of one field of consciousness. As experience grows, more and more complex tendencies to reproductive reaction become formed; and a system of such tendencies—a "system of dove-tailing dispositions," it has figuratively been called—is formed in this way. But the possible oddities and whimsicalities of the mechanical fusion of ideas are almost limitless. Thus we read of one learned man who, when a boy, in order to lose no time, had practised committing books to memory while on the full run. Years afterward the sight of a book mastered in that way brought up the recollection of its contents *fused* with the flitting images of the palisades and hedges by which he had run while reading it for the first time. Another, who in his youth had worked as an apprentice for a hatter, could never look on black wainscoting (like that of the room in which he had worked) without the collective heterogeneous mental picture of all former sensations and feelings—smell of varnish, etc.—being reproduced. Conversely, at the smell of varnish, all the composite picture of his old disagreeable life regularly arose into consciousness. The learned Jew Maimon is said always to have accompanied any very strenuous mental effort—for example, in studying Euler's mathematical works—with "Talmudic intoning and movement of the body," because he originally mastered the writings of the synagogue in that way.

In the case of us all, every complex idea is the resultant of an indefinite number of "traces," or stronger tendencies to reproduce in the unity of one act, those experiences which have involved originally separate activities, but have by the very conditions of experience been compelled to combine. Life is full of such compulsions. Thus some are unable to image the smell of the heliotrope without seeing an imaginary heliotrope at the same time; or to image the sound of a file or the look of a surgeon's probe, except as these images are fused with those of certain cutaneous and muscular sensations. To speak of such a close and inseparable connection of partial representative images as due to "recall," or "suggestion," of one by the other, is in many cases scarcely less inappropriate than to say that the sensations of temperature "suggest" those of pressure, as I lay my hand on a cool marble slab. When, for example, a child begins to whine on being threatened with the summons of the doctor, the case is not so much to be explained under the principle of suggestion, properly so called, as under that of fusion of originally heterogeneous elements into a composite idea. To say that the word doctor "calls up" the idea of a man with saddle-bags, and this "suggests" the occasion of some previous sight of such an apparition, and this "suggests" the medicine he gave, and this "recalls" a nasty taste, etc., seems an altogether lumbering way of describing such a reaction of infantile mental life to certain stimuli of sound. The rather is it true that the child's very idea of a doctor *is* that of a particular nasty-tasting-medicine-man, with the saddle-bags, etc. And this idea, being reproduced in consciousness, may then well suggest the previous experiences which have given birth to it; or it may lead on to the thought of the coming deprivation of privileges which are conjectured as a result.

In fact, every complex idea, whether it originate as a dominating state of consciousness by its own spontaneity or by suggestion of other ideas or percepts, is—whenever it originates and every time it occurs—a *new mental*

growth. That which has become a unity, by a process of so-called fusion, unfolds itself as a unity after the fashion of those flowers which Oriental magicians are said to make grow, almost instantaneously, to full perfection from an infolded bud.

§ 4. That the limitations of every field of consciousness, taken in connection with its unity, result in phenomena which may figuratively be described as a "conflict" and "inhibition" of ideas, there is abundant experience to prove. We may even, not improperly, speak of a "struggle for existence" among the different conscious tendencies to ideation; and thus employ a by no means unintelligible figure of speech. It is only when the attempt is made to extend speculation into the realm of the unconscious (to the ideas below the threshold) and to insist upon a formulated system of psychical mathematics and mechanics respecting the relations of the ideas, that psychological science interposes its veto. To solve sums in the inhibitory value and efficiency of ideas, there are no means at hand. And, indeed, as to the final explanation why some ideas triumph in the so-called struggle and survive, we are even more in the dark than is modern biology about some of its analogous problems.

Various phenomena indicate that impressions of one sense may have a certain advantage over those of the other senses, and so recur more promptly and surely as ideas in the field of consciousness.[1] With men generally sight is thus a *preferred sense.* In the case, then, of any complex sensation-experiences the visual factors, and those other factors which, for one reason or another, fuse most perfectly with the visual, may be said to have the best chances for reproduction in the contest for the field of consciousness. But we have seen that different persons differ greatly with respect to the terms (visualizing, auditory or tactual imaging, etc.) in which they preferably reproduce past impressions. The complex idea of a certain *opus* of Haydn, for example, differs greatly for the musician thoroughly familiar with that particular *opus* (having performed it over and over again), for the musician partially familiar with it, and for the non-musical person who has heard it once or twice. In the first case, clear and life-like auditory images, fused with fainter tactual and muscular images (the violinist or singer), will inhibit all others; in the second case, fainter and more doubtful auditory images, fused with visual images of the notes, etc., may inhibit the others; while in the third case visual images of the concert room, attendant friend, when the piece was heard played, will probably wholly possess the field of consciousness. To such differences all men confess when they remark how much easier for them it is to frame an idea, or to recall an idea, of some things rather than others; how hard or impossible, on the contrary, it is to make some of their ideas correspond fully to those of other people, or even to the facts as they know them to be. Such language implies that each complex idea is a living creation into which different possible elements enter, with more or less of readiness and reciprocal influence, every time the process of ideation is performed.

What the struggle and inhibition of partial ideas means in relation to the completed complex process of ideation, we may understand in a very lively way by dwelling upon certain common experiences. Suppose, for ex-

[1] Compare Lipps, Grundtatsachen des Seelenlebens, I., p. 160 f.

ample, one is trying to recall the face of a person whom one knows well. Fragmentary images, as it were (what his nose is like, his eyes are like, his mouth, the color of his hair, etc.), keep "bobbing up" in the mental field of vision, only to get rejected as false to his likeness; or to be accepted as provisional and capable of fusion with the other elements when the completed picture arrives. All at once, it may be, out starts in good and vivid form the entire idea for which we have sought. Or, again, some one feature may be from the beginning distinctly enough ideated to hold its place as a sort of nucleus, to which the others may rally; or, as a sentinel to admit or to ban all claimants to the field. In a still more lively way may we learn to know what the "reciprocal limitation" of ideas is, by making the attempt to ideate red while pronouncing the word blue; or, to form an auditory image of the note a♯, while reading on the score b♭; or to put the idea of the disagreeable Mr. X. into the pleasant memory-picture of the time we met the agreeable Mrs. Y.

§ 5. In every complex mental state that is chiefly characterized by ideation the principles both of fusion and of inhibition combine to produce the result. That is to say, *each idea expresses a number of tendencies to reproductive energy "solidified"*—if we may so say—*for the time being under the limited and yet unifying activity of that particular moment of psychical life.* In this result some tendencies take a leading and predominating part; others get relatively suppressed. That is, the processes of fusion and inhibition go on simultaneously, and determine the complex result. The decision of the question as to what reproductive tendencies will prevail, what not, may be said to involve the entire past history of this same psychical life. Here (1) attention, and the considerations (intensity, interest, etc.) already discussed, which have to do with the distribution of attention, play an important part. (2) Repetition, resulting in establishing habit and disposition to renewed similar ideation must also be taken largely into the account. But the full discussion of even this more primary form of the organization of mental life implies a knowledge of other elementary processes of that life, which are to be considered later on.

The very nature of ideas, both as respects the physiological conditions of their occurrence and the character of their appearance in consciousness suggests that they have the Quality of "Spontaneity." That impressions, especially those which were originally intense and interesting, and which have had important connections with our entire mental life, should *spontaneously* recur as ideas is precisely what we should antecedently expect. Yet many psychologists deny spontaneous reproductive mental activity. We agree with others, however, in recognizing two kinds of reproduction: (1) immediate and direct, and (2) mediate and indirect. In immediate reproduction the process of ideation is accounted for by the simple fact that it resembles a previous process of ideation or a previous sensuous impression; and so needs no accounting for except the "tendency" or "disposition" left by the previous activity. Negatively stated, the

idea does *not* owe its appearance to association with another idea, whenever spontaneous or immediate reproduction takes place. But in mediate reproduction the cause of the particular process of ideation is assigned to some just previous associated process of ideation. The idea is then said to be reproduced "mediately" or "indirectly"—that is, through some other idea. Negatively stated, it does *not* owe its appearance simply to the tendency left by the original activity, but also to some connected or associated reproductive activity.

A qualified affirmative is the correct answer to the question: Is immediate or Spontaneous Reproduction possible? None of our ideas occur out of the stream of consciousness, and so out of association with that stream; they contribute character to it; they are also determined largely in their own character by the fact that they are parts of one mental life. Physiologically speaking, each particular centrally initiated reproductive process in the brain is connected both with coincident peripherally excited processes, and with other centrally initiated processes recently developed in associated centers. Speaking from the point of view of consciousness, all our ideas repose upon, and are pervaded by, a certain sensuous basis, with which, and with immediately antecedent ideas, they may be said to be associated. On the other hand, the mere reproductive spontaneity of the cerebral process—the explosion of cerebral energy under the incitement of local internal stimulus, in accustomed forms of kinesis—may be the most important part of the entire brain state. And not a few of our ideas simply *arise* in consciousness, without its being at all in our power to detect any idea by which they were suggested or mediately reproduced.

It is customary with those who deny spontaneity of ideation to call attention to our forgetfulness of what goes on in consciousness, and to the multiplicity and subtlety of the associations which exist among the ideas. But this does not constitute a sufficient reply to the facts brought forward by those who advocate immediate, direct, and spontaneous reproduction. Moreover, it is quite possible to reverse the whole manner of approach to the subject, and to make immediate reproduction the basis of all reproduction, to explain, that is, all association of ideas as resulting from spontaneity of ideas. When the plain facts of consciousness are considered without professional prejudice, they certainly confirm the view which regards many of our ideas as springing up into consciousness out of the unconscious (the psychologically inexplicable), rather than as being induced to appear by suggestion, or influence, from contiguous ideas. In

conditions of low psychic energy (as, for example, when we are day-dreaming, in the mutterings of low delirium, or on just waking from sleep) and in conditions when the stream of conscious ideation is unusually rapid (in rapid composition or artistic production, in the whirl of high delirium or excited hours of insomnia), the spontaneous generation of ideas seems especially favored. Of course, by this it is not meant to uphold the causelessness of the origin of any of our ideas. But to deny that random forthputtings of ideation, not to be explained as following any order of association or suggestion whatever, are possible, in any conditions of consciousness, is to render the mechanism of ideas more rigid and narrow than that of any other form of life. It is also to contradict not only the experience of those who have sometimes, like Philo Judæus, had "thoughts fall from heaven like a shower of snow, or like seed from the hand of the sower, into the mind," but also the significant popular estimate put upon the maudlin and incoherent utterances of the dreamer or the drunken man.

§ 6. It is frequently assumed that the presumption is heavily against the spontaneous and direct reproduction of ideas. Thus even Sully,[1] after admitting the possibility of this form of reproduction, goes on to say: "The more we look into the process of reproduction, the more plainly do we discern that the revival of images is conditioned by the antecedence of other psychical contents which stand in a certain relation to the same." In so vague and general a form the statement may perhaps be admitted. But everything in both the psycho-physical and the psychological doctrine of the nature and conditions of reproduction favors, rather than opposes, the spontaneous reproduction of ideas. The tendency of every vivid, life-like, and frequently repeated impression *is* just this, namely, to reproduce itself again and again. No special reason is then needed to account for actual reproduction taking place; but rather a reason why it should *not* take place. This latter reason, in general, is to be found in the limitations of the field of consciousness and in the necessity of unity to the mental life. But if we seek reasons—as, indeed, we must—why *some ideas rather than others* are reproduced, these reasons, too, may fitly be found quite as much in the original or acquired nature of the impression as in the secondary and dependent connections it has established with other impressions.

§ 7. Particular facts which confirm the theory of the spontaneous reproduction of ideas are such as follow: For some time after any strong impression has been received, the complex ideation-processes corresponding usually keep persistently recurring in consciousness. The impressive truth is not so much this—that everything now suggests just these ideas and no others—but rather that we cannot find percepts or ideas impressive enough to sug-

[1] The Human Mind, I., p. 295. For the opposite view see Volkmann: Lehrbuch d. Psychologie, I., p. 410 f., and a very interesting monograph, Ueber Phantasie-Vorstellungen, by Anton Oelzelt-Newin. Graz, 1889.

gest *any other* than the now dominant ideas. The lover needs no suggestion to think of his mistress; although, as a matter of fact, everything does suggest her. But the patent truth is rather that her image tends to exclude all other disconnected ideas. So the central image of the dead child, and its escort of other allied images, with the tones of feeling indissolubly attached, for the time being "take possession" of the mother's mind. In all such cases our general feeling, even when we are not actively engaged with the dominant idea, is that of keeping it constantly repressed, only with the greatest difficulty. There it is—just in the background, scarcely below the threshold of consciousness, and ready to step out, or rise up, the instant we relax our restraining hand. It "will not down," for any long time. And thus men, as is so suggestively said, strive so to occupy attention as to "keep out" certain thoughts; or "drive them away;" or else they try to "drown them" in some form of oblivion artificially secured. It is this experience which induces us to speak of a sort of "tension," or "strain," causing a disposition to ideate in a certain way.

Again it sometimes happens (usually in conditions of abnormal cerebral excitement) that our ideas "go wild"—as we are wont to say. In the most provoking or amusing manner the psycho-physical mechanism then proceeds to throw up into consciousness all manner of rubbish from the cellars and garrets of our past mental life. Order or relation *between* the different ideas there is apparently none. Nor does a true theory of ideation require that there really should be connection or association established between the contiguous members of our ideating under such circumstances. Such a general condition is probably better explained by referring it to the removal of the ordinary inhibiting influences.[1] Hence arises a random, "fancy-free," play or turmoil—sometimes a genuine hurly-burly, or rout—of ideas. When this takes place, surely enough no one can tell "which way" the ideas "will jump." And yet snatches of the ordinary laws of fusion and association appear, according as connection is established between several of the successive members of this mad frolic of reproductive energy. [All of which the "Herbartian jargon" would, with a measurable truthfulness, represent as follows: "When an idea rising into consciousness finds another idea qualitatively like itself also appearing there, it fuses with the latter in the degree of its constant similarity as well as of its variable height, and thus gains additional strength against every inhibiting influence that threatens it."]

In the case of "fixed ideas," such as those to which persons of abnormal or insane mental condition are liable, the persistent recurrence of similar ideation-processes is surely not to be accounted for as the result of suggestion or association of ideas. The principle here applicable more nearly resembles that implied in the spontaneity of ideas. We are not, indeed, to regard this principle after the analogy of a sort of physical inertia, or bare persistence, of the ideas; it is rather to be regarded as the result of a continued disposition or tendency, a statical mode of the exhibition of the soul's life.

Many of the phenomena of dream-life may also best be explained by the principle of the spontaneity of ideas. It is the stern limitation and regular control of the ideas by percepts furnished from without, and by the necessi-

[1] In which Strümpell suggests (Psychologie, p. 49 f.) are to be found the reasons for the freistei-gende Vorstellungen.

ties of adapting the mental train and bodily movements, as an organized whole, to the securing of certain ends, which prevails in our waking life. These things inhibit the great multitude of the otherwise spontaneously recurring ideas. But in dream-life the pressure both from without and from within is withdrawn. Then innumerable forgotten and concealed tendencies to ideate, at random as it were, become substituted in part for the so-called laws of association. Impressions that are very powerful for our waking life may then have no preference over those that are weakest or most deeply hidden in the lowest strata of mental life. Thus quick and varied metamorphosis belongs to dreams. Neither the dreams as finished wholes, nor the parts that enter into any one dream—it not infrequently happens—can be said to suggest each other. Anything may happen in a dream—rather than that which would most naturally be suggested by what has happened just previously. To affirm that we are here dealing with laws of association instead of looking upon biological processes, which lie below those very laws, is to reverse the true scientific account of the facts. It is just by association, as directed to recognized ends, that this medley of psycho-physical vitality is reduced, and kept reduced to order. But in much of our dream-life we are looking on the naked, disassociated, biological simplicity of the soul.

Some theory of the "Association," or "Suggestion," of Ideas is, however, made necessary by the way in which different processes of ideation, and states or fields of consciousness as determined by these processes, stand related to each other in time. The phrase "association *of*" is fitted to mark the bare fact that complex ideas, which had a more or less independent origin, are in the habit of recurring in regular sequences (in pairs, or threes, or series of larger number). Hence a sort of *Bund*, or affiliated union, is figuratively declared to have been established between the ideas; and the individual ideas form members of this *Bund*. The word "suggestion," however, is customarily followed with the preposition "by;" one idea is said to be "suggested *by*" another. Thus we represent our experience in terms indicative of our conviction that in the on-flowing but closely connected stream of consciousness a causal influence is exerted between the processes of ideation.

Upon this way of looking at the relations existing between different processes of ideation several remarks are in place just here. Whether, in general, one mental state can properly be said to *cause* another; and, in special, whether the production of one idea is *really* to be attributed to the occurrence of a preceding idea—these are questions of metaphysics with which empirical psychology need not deal. In a statement, however, which aims to cover the facts of so-called association of ideas, and to explain them by pointing out the regular forms of their recurrence, the following truths must be borne in mind. Move-

ment, or succession of states, in time is of the very essence of mental life. Movement of the ideas, involving their constant rising and sinking in consciousness, is of the very essence of the process of ideation. For no more than a limited number of ideas, however relatively simple and partial, can exist in any one field of consciousness; and—"Time is on the wing." The relations between the complex states of ideation (memory or imagination) become, as a matter of course, more complicated and difficult to trace when we consider them in the succession of time. Far more complex conditions enter into the determination of the question, what ideas shall follow each other (be suggested by each other, associated with each other) than into the determination of the question, what partial ideas shall fuse with each other.

Another truth concerns the very limited nature of the application of the so-called laws of the association of ideas to the entire mental life. *It is our total states or fields of consciousness which follow each other in the succession of time.* When we describe and explain *them*—what they are, their genesis and development, and the order and laws of their arising—we have done all that descriptive science can do to set forth the nature of the mind. But mental states are always something far more than ideas; and the conditions of their genesis and succession are by no means wholly to be ascribed to so-called association of ideas. Mental states are states of knowledge, feeling, will—all three in each state; and their succession in time involves—or rather, it *is*—the entire knowable being and history of mind.

Nevertheless, just as the idea is a most important factor in every form of mental life, and the process of ideation an indispensable condition of all mental development, so the laws of the association of ideas are indispensable to a scientific account of the successive phenomena of mental life. Two general facts give great importance to the study of this subject: (1) The succession of ideas is relatively "*free*." We cannot predict on grounds of our own mental habit, or determine largely by choice, what we shall see, hear, feel, etc., when the organs of sense-perception are in their customary normal relations to the object. Perception is *bound* to things and to the order of their occurrence. And with bodily pleasure-pains it is much the same way. But the succession of our ideas is obviously much more a matter of our own mental nature and of our choice. This is true even of memory; it appears pre-eminently true of imagination. In fancy, above all, are we "free." But (2) the succes-

sion of ideas is not ordinarily free in the sense that our present ideas are not dependent for the determination of their character upon ideas immediately or more remotely preceding. Ideas ordinarily arise in consciousness, in the succession of time, in pairs, groups of three or more, or longer series. Moreover, we are aware of a sort of transition, that partakes of the nature of compulsion, between them. If I have the idea *A*, then I may expect to have the idea *B*; but if I have the idea *M*, then I may expect to have the idea *N*, etc. Now this formula—if *A*, then *B*; if *M*, then *N*, etc., is precisely the formula which necessarily suggests a connection between *A* and *B*, and between *M* and *N*, etc. Indeed, since there is no absolute gap, or break in the continuity of the stream of consciousness, we may thus be said (especially in certain instances where the succession of the complex fields of consciousness is rather slow in time-rate) to witness the merging of one idea into another, associated *with* it, or suggested *by* it. While the second of the above-mentioned two classes of facts is emphasized by the term association of ideas, the freeing of ideas is quite as important in the development of the life of ideation, and in the influence of ideation upon the development of all mental life.

Any theory of the association of ideas raises the general question: What conditions belonging to antecedent processes of ideation determine the succession in time of the subsequent processes of ideation? More popularly: Why do our ideas follow one order rather than another in the stream of our conscious life? To this question one equally general answer may confidently be given: When conditions similar to those belonging to the antecedent processes recur, then the succession of the subsequent ideation-processes will be similar to that of the antecedent processes. In other words, those ideas follow any given idea which, rather than other ideas, come under previously established connections between the psychical states which they represent. *Not only single impressions, but successions of impressions, tend to be reproduced in a manner similar to the original impressions; and the reproduction of the time-order is a part of the general disposition to reproduce.*

But experience develops an increasing variety of connections in time for similar ideas; and in the actual order of any particular case of reproduction, only one of these many possible connections can be actualized. Figuratively speaking, a conflict of tendencies to reproduce in different pairs, groups, series, may be said now to arise. The acknowledged reproductive process, the idea which really "succeeds" in the succession of ideas, will be the

one which has had the *strongest* connections established with the producing process. What are the "strongest" connections will depend in every case upon a variety of considerations, of which the more important will subsequently be pointed out. It is scarcely an exaggeration to say that every particular case of succession, or association, of ideas involves the whole of the previously existing mental life—and this often in a very baffling way. If, however, we express in one principle the general facts emphasized by reproduction of ideas in the succession of time, we may say that it is "contiguity" in consciousness which forms the fundamental explanation for all association of ideas. But such contiguity—whether temporal or spatial—must be conceived of as purely psychical; the associated ideas *reappear as contiguous* states of consciousness (are associated), because they represent processes that *were*, with varying degrees of intensity, *contiguous* states of consciousness.

Developing mental life is far more than a mere mechanism of ideas; and even what is ordinarily embraced under the laws of the association of ideas will finally be seen to be inadequate to explain the phenomena without the conception of a yet more fundamental teleological principle.

§ 8. The attempt to account for all mental phenomena and for mental development in terms of the mechanism of ideation has repeatedly been made by the reigning schools of psychology. The elaborate theory of reciprocal "furtherance" and "hindering" of ideas, not only in consciousness, but also "below the threshold" of consciousness, which the Herbartian theory proposed, would seem to have done all that was possible in this direction. The attempt failed in Germany; its failure has thrown discredit upon much that is exceedingly valuable and suggestive for the understanding of mental phenomena. Something similar may be said of the English "associational school," even when its theory is combined with innumerable data and figurative terms (used, for the most part, with misleading literalness) drawn from biological evolution—as, for example, by Mr. Spencer. Failure will undoubtedly come also to the present revival of the attempt in Germany (by Ziehen and others), upon an experimental basis. For mental life *is* far more than, and far different from, a succession, chiefly, of associated ideas. On this point ordinary experience, and the language in which all men express experience, may be—at least in a preliminary way—considered as decisive. For example, one's working life for any single day consists of successions of states which depend largely upon one's disposition (well or ill, bright or dull, pensive, gloomy, or joyful), environment (at home, in the study, on the street, etc.), and especially one's plan for the day (writing, lecturing, holiday, etc.). To reduce the total explanation of all this to association of ideas, and to deny the power of choice to interrupt the mechanism, as well as to overlook the inexplicable spontaneous "tele-

ology" of much of our ideation, is to construct and spread a bed quite too narrow for the mental manhood to stretch itself upon.

§ 9. Little need be added to what has already been said respecting the physiological conditions of the succession of associated ideas. That association requires time, and that this time is psycho-physical, and indicates the spreading of the initial cerebral processes over more and more of the connected areas, is abundantly shown by experiments in reaction-time. Experiment also shows that the more weak and the more complex the associations are, the more the psycho-physical time necessary to make them is prolonged. Among the most favorable cases are those in which some definite memory-image is called up by a presentation of sense, such as a picture seen or a word spoken. Here the time required for "simple-discernment" —of the meaning of a word, for example, through suggestion—was found to vary from 57 σ to 177 σ; but if further association was required an average of some 727 σ elapsed before the associated idea arose, under the most favorable circumstances, to consciousness. Such association-time is still further greatly prolonged in certain cases where the result, when it comes, may be looked upon as odd or unexpected; or where a pause seems to have taken place through hesitation between several ideas simultaneously suggested. Thus the total time required in reacting on associating from "gold" to "silver" required only 402 σ; from "clear" to "dark," 507σ; and from "north" to "south," 502 σ. But to associate "art" with "æsthetic activity" required 1,899 σ; and to judge that "fame" is a "form of the ascription of praise," 2,023 σ.[1] [It should be noted that we are in these latter cases dealing with the associations of words and phrases as dependent upon the development of conceptual knowledge.] Other experiments[2] resulted in giving the time necessary to translate images into one's vernacular as about 477 σ–545 σ; but into a foreign language, as about 649 σ–694 σ. Translating *and* naming short familiar words was found to require 199 σ–258 σ more time than merely naming; and associating the land in which a city is situated with the name of the city, or the time of the year in which a month occurs with the name of the month, requires from $\frac{1}{5}$ to $\frac{1}{4}$ sec. of psycho-physical time, when all factors are well known.

The changes in reaction-time due to association, taken in connection with what has previously been said respecting the physiological conditions of all reproduction would seem to warrant some such statement as the following, quoted from Professor James:[3] "The amount of activity at any given point in the brain cortex is the sum of the tendency of all other points to discharge into it—such tendencies being proportionate (1) to the number of times the excitement of each other point may have coexisted with that of the point in question; (2) to the intensity of such excitement; and (3) to the absence of any rival locality or process functionally disconnected with the first point, into which the discharges might be diverted." It must be confessed, however, that all this is highly conjectural, and, at best, only expresses a possible formula for the merely physiological conditions of the associational elements of mental life.

[1] See the experiments of Trautscholdt, in Philosoph. Studien, I., Heft 2, p. 213–250.
[2] Compare Philosoph. Studien, IV., Heft 2, p. 241 f.
[3] Popular Science Monthly, March, 1880.

Further evidence[1] as to the physiological conditions of association may be derived from cases where the range, speed, and accuracy of association are affected by cerebral lesions, or by changes in the arterial circulation of the brain. Association-time in melancholia and dementia is regularly greatly lengthened; in mania, on the contrary, it is often much reduced. In such cases the more purely automatic functions of association (the "mechanism of ideas") suffer less than the intellectual and voluntary processes. In cases of aphasia also (or loss of power to use and understand spoken or written words, due to lesions in the brain), the association-tracts connecting the different brain-areas being impaired, the mechanism of association is disturbed.

§ 10. That contiguity in consciousness, as just explained, is the fundamental principle of the reproduction of associated ideas in time seems to follow from the very nature of reproduction in general. That is to say, all merely *mechanical* reproduction falls under the principle of contiguity. It belongs to the development of this principle to show how the so-called laws of association by similarity or contrast, coincidence in space or time, etc., are all of them only special cases under it. So far as our physiological knowledge bears upon the psychology of association, it is entirely in favor of the supreme and exclusive value of this principle. If we limit the statement to the physical basis of the mechanical association of ideas, we may then safely agree with Fouillée when he affirms: "Contiguity in time links things only by means of a contiguity of extension in the brain." To this may be added the obvious truth that it is intelligence which takes note of "similarity;" and thus, in the psychological realm, *i.e.*, in consciousness, association by similarity is a consequence of association by contiguity.[2]

Under the figure of speech involved in the word contiguity, however, we understand a *psychological* principle, a general form of the occurrence, in relation to each other, of *mental* processes, of *psychical* facts *as such*. And here we come upon a yet more general fact or law, behind and beneath which psychological science is quite powerless to go. All psychical processes which originally occur in close (or contiguous) relations of time become so vitally bound or associated together that they tend to recur in relations of time like the original relations. Strictly speaking, this principle is not due to the ideas themselves or to the compelling force of time; nor is it to be ascribed to influences extraneous to the mental life. On the contrary: *Association by contiguity is the one principle which underlies and makes possible any continuous development of mental life whatever;—but only so far as the so-called mechanism of association is concerned.*

A most fruitful means of studying the application of the principle of "contiguity" to the Reproduction of Associated Ideas is afforded by the recurrence of the ideas in pairs, groups, or series. The range of the application of the principle in this form is very great. Even in the reproduction of complex ideas

[1] See the careful and interesting experiments of Marie Walitzky on patients in an asylum for the insane, Revue Philosoph., Dec., 1889.

[2] See also Rabier (Psychologie, p. 190 f.) who maintains that contiguity is the one law of the association of ideas; and compare M. Brochard, La Loi de Similarité, Rev. Philosoph., ix., p. 257 f.

whose elements are only partially "fused," numerous cases occur that come under this rule. Thus the entire group of related partial images may not appear within the easy, or even within the utmost possible grasp of one field of consciousness. As therefore the different members of the group succeed each other, and so constitute different states of ideation, they fall under this principle of association by contiguity. And, indeed, no fixed line can be drawn between the principle of "fusion" and that of "association" by contiguity. The complex image representative of an absent face or of a scene of years ago, for example, may under one condition of body, or in the case of one person, spring forth complete into the unity of conscious life; at another time, or in the case of another person, it may be reproduced bit by bit, as it were—one bit suggesting another with which it had become associated by contiguity in consciousness. Subsequent study of the development of perception will show how both fusion of ideas and association of ideas by contiguity are necessary to all knowledge of sensible objects. *All early training and development of mental faculty requires the repeated production* (as respects both the original impressions and also the representative images of those impressions) *of similar psychical processes in similar sequence of time.* It is upon the basis of such associations, acquired under the principle of contiguity, that all freedom of thought, imagination, and action takes place. Without having our ideas *bound* into pairs, groups, and series, in the succession of time, we should not be set free to think, imagine or act. The very basis of experience and intelligence requires that a psychical automatism should be perfected through association of ideas under the principle of contiguity.

Observation of the nature of all mental development shows the important influence of the mechanical reproduction of ideas in the original order of succession in time. It is through this influence and by means of what it achieves for us, that we walk, talk, sing, use the senses in perception, "conduct trains" of imagination, memory, or thought, and indeed "lead" all our daily lives. It is largely through differences in the character of this complex mechanism of association that different individuals are unlike. These differences characterize the essential nature of the mind's life. Innumerable long series of representative images thus tend to run themselves off, in a fixed order of time, if only the series is started, either at its beginning or with some other member of the whole. Snatches of series—ideas bound together in pairs and in small groups, because they have occurred together as contiguous members of longer series, are

perpetually rising up into consciousness. Every sound (much more every word) heard, every sight seen, smell or taste experienced, every feeling of muscle or skin, is liable to suggest several such "seried" ideas. And every idea in each of these suggested series will probably, in its turn, start a new pair, group, or longer series, of other associated ideas. Most of these shorter or longer series prove, on closer examination, to be more or less familiar, not only as respects their content as individuals, but also as respects the order of their succession. This is because similar ideas have frequently had a similar order of succession in our past experience.

The simpler cases of associated ideas, as reproduced in their original order of succession, by no means, however, include all applications of the general principle. Two important subordinate principles must also be considered: (1) Ideas associated in series under the principle of contiguity come to have a reciprocal influence in reproductive activity. The tendency to reproduction is, of course, greater in the original order of the series, and between the most nearly contiguous members in the forward direction of the series; and this tendency is also, of course, increased by repetition, within the limits of fatigue, distaste, overstrain, etc. But the tendency to reproduce each other also exists within certain not easily assignable limits, between members not immediately contiguous and in other directions and sequences than those of the original lines. Hence, any series may become variously broken up; and, by an extension of the principle of contiguity, any member may come to recall any other, with which it was not originally closely associated and in a different order from the original sequence. What particular member of the series recalls what other will depend, in each particular case of associated revival, upon a variety of influences, such as original or acquired intensity of the members concerned, repetition, disposition, environment, interest, and planful movement of the mental life at the time of recall, etc.

(2) Ideas associated in series under the principle of contiguity suffer a process which may figuratively be described as that of "condensation." Certain members of the total original sequence tend to become obscured, or altogether to drop out of the collective train of associated ideas. In all cases of great familiarity with any series the mind hastens forward, as it were, to the end; for it is to the end of the series, rather than to its individual intervening members, that our chief interest is regularly attached. In the case of any long series of reproduced associated ideas, the emphasis of interest and reproductive energy rises

and falls in a sort of rhythmic way. Thus, *some of the members of any series come to stand as representative ideas, not only for their own originals, but also for several of the contiguous members of the original series; and these contiguous members take the subordinate part of faint (somewhat parasitical) "fringes" of ideation for the emphasized ideas.* Series of considerable length, originally, are thus condensed into comparatively few members; or even into a rapid ideation-process that seems almost to fall within a single grasp of consciousness, and so is entitled to be considered as only one exceedingly complex idea. Here we are plainly dealing with phenomena, on a larger scale, which closely resemble those already treated under the so-called fusion of partial ideas. For here again the essential condition of all mental development is that the mental life shall not be obliged to repeat itself in detail; we must be allowed to cut out the unessential members of the reproduced flowing stream of consciousness, and let one stand for many as their "representative," so to speak. But these representative ideas of the larger order themselves attain a modified character through this very process; otherwise they could not be *representative* of a number of ideas in a series. For example, the train of ideas started in the consciousness of a musician by the first chords of a symphony, or of a mathematician by the first words or symbols of a complex formula, may represent the entire sequence of chords, or words and symbols, in a manner at once more rich in meaning and more condensed in number of separable members.[1]

It is even now evident that this condensation of series of representative images, together with the closely connected process of freeing all the images from the necessity of recurrence in just such, and no other, fixed order, is indispensable to conception and to thought. Indeed, we shall soon see that in the process of mental elaboration, reproductive images and conceptions can be separated from each other by no hard and fixed lines.

§ 11. All the principal features of association by contiguity, as applied to reproduced series, may be illustrated by any number of familiar experiences. For example, we tend most strongly to recall, and actually do most easily and frequently recall, the alphabet of our own language, in the sequence in which we have learned it. Mention of any particular letter (*K*, for example) immediately summons the idea of the next following (*L*); groups like *L*, *M*, *N*, run off with peculiar smoothness. For, again, these three letters probably belong to the several subordinate series within the entire series which

[1] For a very interesting and suggestive, though somewhat fanciful development of this subject, Verdichtung der Vorstellungen, see Lazarus, Leben d. Seele, ii., pp. 229 ff.

are bound together with peculiar intimacy of association (*A*, *B*, *C*; and *X*, *Y*, *Z*, and other like groups). Moreover, it will probably be found more difficult to move in idea from *L* to *K* than from *L* to *M*; and yet any letter recalls its contiguous neighbors in the backward order more readily than the very remote members of the series recall each other in either direction, unless, indeed, some other association has been established between a pair or group of such remote members. Still further, it will be found that, in rapid reproduction of the series, the mind seems to take long leaps, as it were, and to come down upon some of the members with peculiar emphasis (a matter due, perhaps, to muscular and respiratory rhythm connected with both the learning and the reproduction of the series). Finally, from *A* to *Z*, or from A to Ω, may come to stand for the entire series, with only a vague imaging and feeling of any content between the two ends; or *A*–*B*–*C*, etc., may fuse into one idea, with a sort of added flourish of imaging and feeling to signify the addition of a long tail to this head of our series; and so (*A*, *B*, *C*) become representative of the whole alphabet.

Further illustration may be taken from the way in which people generally recall tunes. The unfortunate amateur who has "started" one, and got switched off on to another by reason of similarity in a pair or group of following notes belonging to the two tunes, can scarcely ever recover himself without going back to the beginning and starting over. The danger of repeating the mistake recurs whenever the place where the two series of associated notes coincide is reached. So closely bound together in the forward direction are the members of even a simple musical series, that it may well be doubted whether any musician can sing "Old Hundred"—for example—from memory backward correctly on the first trial; although the tune produced in this way is perhaps better music than when produced in the original order.

§ 12. Experiment tends further to confirm the principle of contiguity as applied to series of ideas. Ebbinghaus, in learning series of non-sense syllables, found evidence that even the remoter (not *immediately* contiguous) members of a series strengthen each other. Thus, any series once learned and then forgotten could be relearned with a saving of effort amounting to 33.3 per cent. for the next contiguous members; but on skipping one syllable, the saving was still 10.8 per cent.; and on skipping two, three, or four syllables, it still remained 7.0, 5.8, and 3.3 per cent., respectively. This saving can only be due, it would seem, to association of members in the inverse proportion of their original distance from one another.

We have already seen how the grasp of consciousness includes a much larger number of objects if they may be connected together into wholes answering to some idea. Thus Cattell found that three times as many letters connected into words as disconnected letters could be comprehended in one field of consciousness. It falls under the principle of association by contiguity in consciousness that the revival of impressions originally thus "ideally" connected is so much easier and more complete. Thus Ebbinghaus found that it required only one-tenth as many repetitions to learn the same number of syllables when making sense as compared with non-sense syllables. The nonsense of the nursery rhymes which so please and stick in the memories of children, as well as that which "now and then" delights

"the best of men," is very far indeed from being *non*-sense. It is also pertinent to notice that the number of objects which can be grasped together in the contiguity of one perceptive consciousness is about the same as that easily reproduced in the form of associated ideas under the principle of contiguity. Ebbinghaus also found that one reading would suffice for an accurate reproduction of a series of from six to eight members; while thirty readings were necessary for sixteen syllables. From many such experiments with series of non-sense syllables the law was formulated: "Presentations once aroused in consciousness, simultaneously or in immediate succession, reproduce each other; and more easily, in the direction of the original succession, and with greater certainty, the oftener they have been together."

§ 13. The effect of the process described as "condensation" upon the character of any series of associated ideas is obvious enough. There are few, if any, of our adult experiences, where one idea is said to suggest another, in which this effect is not prominent. The first step toward this effect consists in bringing the originally remoter members of the series into closer contiguity, and thus binding them together for future recurrence as closely associated ideas. Thus if the original series be indicated by *A*, *B*, *C*, *D*, etc., and *B*, *C*, be much condensed, or altogether dropped out, then *A* and *D* are brought into such contiguity in consciousness as forever after to become associated ideas. When any series of mental images, such as that belonging to a familiar stretch of natural scenery, or to a passage from an author, a proverb, a salutation, an announcement, or a musical aria, is started, at once the reproductive activity overleaps the members that originally intervened, and suggests those that for some reason have become most representative of the entire series. In these cases, try as we may to proceed in regular reproductive order over the entire series, we cannot avoid these leaps. Imagination and memory thus find themselves under the influence of tendencies which enable them the better to act as substitutes for (to represent) the fulness of content and speed of movement which the presentations of sense and of self-consciousness enjoy.

§ 14. Here, again, we come upon those secret processes of change in reproductive energy that make thought and language possible. The "condensation" and "freeing" of associated ideas is necessary in order that words may have their pregnancy of representative meaning. This is illustrated in a very instructive way by the formation of compound terms to stand for the representative activity belonging to condensed series. The more naïve and unscientific the work of compounding, the more instructive its result. Thus modern Japanese has one word composed of the first characters in the names of its three principal cities (Kyoto, Osaka, and Tokyo); the idea associated with this word stands for the resultant of repeated contiguity in consciousness of these three associated individuals, with the added importance which the fact of their association brings. For, as has already been said, the ideas brought into closer contiguity, and associated by this process of so-called condensation, are not themselves unaltered by the association. They are rich with the fragments of the content of the vanishing members of the series; their life is the fuller, because into it has passed a part of the life of the defunct connected branches of the family they represent. It is largely in this respect that men differ as to their so-

called ideas—from those who can condense into one reproductive process the nutriment derived from years of growth—to those who, like the soldier already referred to, cannot think at one time of more than two of the three ingredients of gunpowder.

The association of series of representative images with series of motor tendencies is, doubtless, of great importance in furthering and modifying the entire reproductive process. In such cases as the foregoing, a partially reflex and partially voluntary accompaniment of speech is, in the case of adults, usually to be detected. Association by contiguity in consciousness, then, in the largest meaning of the term, includes this accompaniment. The great, and even indispensable assistance which "motor-consciousness" renders, is hinted at by the experience of Münsterberg,[1] who found he could reproduce in order a series of seven to ten letters, exposed 1 sec., with almost no errors, in case he could concentrate his mind on holding on to one letter until the next came; but if he was occupied so as to be deprived of the motor accompaniment of speech, mistakes in the order of the series greatly increased.

§ 15. It is by no means our ideas alone which suffer this treatment called a process of fusion and condensation. The affective accompaniments of our ideas share in the same process. Thus, by the image-making activity, feelings which have repeatedly followed certain sensations, perceptions, or thoughts, become so attached to the ideas of such sensations, perceptions, or thoughts, as promptly to arise in connection with them. A vivid memory-image of how a certain experience of my own once felt, or a vivid imagination of how some other being is now feeling, is immediately followed by that same feeling in the present conscious life. Thus we not only have an idea of how our friend feels in the dentist's chair under the file; but we may actually feel the filing in our own teeth. Meyer's story of the man who, on crushing the finger of one of his own children in the door, "felt a violent pain in the corresponding finger of his own body," which lasted three days, is only a somewhat extreme illustration of this.[2] The large province of "suggested" pleasures and pains is to be explored in the light of this principle.

Among the more widely recognized "Laws of Association," so-called (besides the subdivision of the principle of contiguity into Time and Space), association by Similarity and by Contrast have stood first; then follow such forms of suggestion as Cause and Effect, Means and End, Sign and Thing signified. The three laws of the first rank—contiguity in time and space, resemblance, and contrariety—were enumerated by Aristotle; and, coming down at once to Hume, we find him omitting contrariety and adding cause and effect. It is *similarity*, however, which has either contested, or shared, with contiguity the honor of being the irreducible principle under which all suggestion of ideas by one another must fall. And, indeed, many modern

[1] Die Association successiven Vorstellungen. Zeitsch. f. Psychologie, 1., Heft 2 (1890).
[2] Untersuchungen über die Physiologie d. Nervenfaser, p. 233.

psychologists still persist in speaking as though, since ideas do (in some wholly mystical and inexplicable way) influence each other causally, this principle—"like produces like"—must be acknowledged as the one fundamental law of ideating mind.

We have already seen that, in general, only in a figurative way can ideas be said to reproduce each other. The truth which really answers to this figure of speech is found in the ultimate fact that the psycho-physical condition of reproduction, and the actual reproductive or ideating processes themselves, show reasons for assuming certain tendencies, or dispositions growing out of past activities. What takes place in consciousness, as associated ideas are reproduced, is to be explained by what has previously taken place. Further, what has previously taken place may be summed up in the one principle—of the influence upon each other of contiguous psychoses. But the question now arises, whether all cases of so-called association of ideas, that are explicable at all, can be explained in this way? In other words, is the principle of association of ideas under the influence of contiguity in consciousness the *sole* discoverable psychological principle? To this question we give an affirmative answer—limiting both question and answer, however, by our previous use of terms.

Most cases of the above-mentioned laws are so readily reducible to association by previous contiguity in consciousness, that they need little examination in detail. Cases of alleged association by contrast sometimes occasion more difficulty. Few modern writers on psychology, however, maintain with Aristotle and others that "contrariety" is an independent principle of the association of ideas. Moreover, contrast is so closely connected with resemblance or similarity as an associating principle, that the claim of the former to be an independent principle cannot stand, if the claim of the latter falls. We may then bring the principle of contiguity in consciousness to its final testing, by the inquiry whether it will account for all cases of alleged association by similarity. But here we must be on our guard against two fruitful sources of confusion of thought. (1) The term "similarity" is after all only a relative term. If on the one hand, and strictly speaking, it may be said that no two presentations or ideas can ever be precisely the same, it may also be said, on the other hand, that few presentations come into contiguity in consciousness without observed points of similarity, and few ideas of such presentations follow in the mental train that may not possibly develop points of similarity. Now, the advocates of similarity as an ultimate principle of the asso-

ciation of ideas invariably hypostasize the idea: they speak —that is to say—of ideas as entities capable of showing *statical* points of likeness and unlikeness. But for ideas considered as capable of influencing or suggesting each other, a psychology true to the facts obliges us to substitute ideating-processes. This alleged law of association then becomes the statement that every ideating process, as an individual process, tends to produce next following it a similar ideating process—irrespective of any previous activity connecting the two, or of any conscious end to be reached in making the connection. But such a statement is not borne out by the facts; moreover, it is utterly inconceivable how such a general fact should be considered as *a law of the mind's reproductive procedure* at all.

For (2) *the whole theory of association by similarity rests upon a confusion between those laws which regulate discriminating consciousness in acquiring the original presentations and those other laws which regulate the mechanism of reproduced associated ideas.* That so-called ideas *get* associated under the law of similarity by conscious discrimination, and so, having been bound together by contiguity in consciousness, recur as originally bound—this is one thing; but that ideas, on recurring, tend to suggest other similar ideas, irrespective of their having ever been thus actively associated by discriminating consciousness—this is quite another thing. Association by similarity is indeed one of the most extended and fundamental of all the laws of primary intellection. We have already seen that all consciousness, that attention even in its primary forms, and that the formation of sensation-complexes and the having of definite or vaguer states of feeling, as well as the formation of complex ideas by so-called fusion, all involve the discrimination of like and unlike, and the assimilation of that which is like. Now, it is in the contiguity of this primary discriminating consciousness that like gets associated with like, and *pari passu*, in some sort, becomes separated from the unlike. It is this procedure, as it grows more and more complex, purposeful, and truly intellectual, which prepares the similar and contrasted ideas, as it were, to suggest (or associate with) each other. But this, instead of being something different from the principle of association by contiguity in consciousness, *is* precisely the same thing as this principle itself.

If now we unite the foregoing two sets of considerations, we see how much that is true belongs to the explanation of association by similarity. The "similar" and the "contrasted," in idea, differ for different persons almost beyond all assignable bounds. Men in general do not notice, with any high degree of discrimi-

nation, likenesses and unlikenesses that have no teleological significance for their daily lives. The multitude, for example, cannot even tell you what color the grass is "like," or the bricks of a particular building in a street they have daily passed, etc. Propose the question as to which of the parental families any child is "like," in the presence of a half dozen relatives, and note how unlike their ideas of "likeness" are! Or listen, with the same intent, to a half-score of gazers at the summer evening clouds, and hear them tell what human or animal forms are suggested as "similar" to the outlines in these vaporous types. Nothing which is *suggested as like to* the suggesting idea, when one sort of mood or plan creates a disposition to regard all ideas in a certain way, *is really like* that which is suggested during another mood or ruling plan. But all suggestions, regarded as falling under the mechanism of ideas, are alike significant of a tendency to reproduce in such pairs, groups, or series, as have been, somehow and at some time, produced before.

§ 16. The ordinary cases of association by contiguity in space or time, easily fall under the same general law. Things that *are* together in space, or events *actually* contiguous in time, never become associated, unless they are *mentally* united, or *known* as contiguous. In every complex act of perception, apperceiving consciousness is, by the very nature of its activity, engaged in associating the different objects perceived. To the association of the idea of any of the parts with the whole, or of the whole with any one or more of its parts, the same truth applies. The very act of knowing whole and parts together is a process of uniting, under the principle of contiguity in consciousness, those presentations which, when they recur as ideas, suggest each other because they have already been associated. Cases of means and ends, causes and effects, signs and things signified, as they suggest each other in pairs or groups, and in whatever order, come under the same principle. Thus the sight of a poker near the open fire suggests, even in our friend's house, the poking of the fire; or, if no fire is lit, the propriety of having one lighted. Here the "original" has been a somewhat extended series, stretching between the poker seen and the fire poked; but by a process of easy condensation, poker and fire have become so associated that suggestion works immediately in either way. It is by similar repeated series of impressions—presentations of sense and ideas—that oiled rags lying in a heap, or unignited matches on the floor, are associated "at a leap" with the building already on fire, and the accompanying feeling of alarm and indignation. All our interpretation of every kind of sign—whether visible, tangible, or that obscure "feeling in the bones," which the superstitious regard—is suggested under the same principle. [Here comes in the so-called theory of the relations between *Lautbild*, *Schriftbild*, and *Vorstellung*.] It originally required a long series of questionings and inferences, or mistaken guesses, to establish contiguity in consciousness between that particular look of our friend's eye, or the set of his jaw, or the play around his mouth, and his

mental state thus signified. But the intervening links have long since dropped out of memory; and we now have a clear idea of what he thinks and feels by a sure spring from the delicate standing-ground of our immediate perception of the changes of his countenance.

§ 17. It seems strange to find even so acute an analyst of mental processes as Lipps,[1] for example, affirming that "the idea or sensation *a* produces the idea *b* with an energy which is proportioned to the degree of their *similarity*" rather than "proportioned to" the character of the connection previously established between the ideating processes indicated by *a* and *b*, respectively. Then follows the misleading figure of speech about the "support" which similar ideas give to each other, etc. Even Höffding[2] ventures to affirm that, "so far from association by similarity being resolvable into association by contiguity, every association by contiguity, on the contrary, presupposes an association by similarity, or at least an immediate recognition." But this, as we have already pointed out, is to confound the laws which regulate the binding together of the elements and objects into the unity of one field of discriminating consciousness, and the laws which regulate the succession of associated ideas; moreover, such a statement uses the words "similarity" and "contiguity" in a way not warranted as applied to ideas.

The important distinction we are advocating will perhaps best be made clear by an example or two. Wherever an alleged association by similarity has previously taken place, especially if it has repeatedly taken place and so become an habitual association, the principle of contiguity in consciousness plainly applies. But let us take the very case selected by Höffding as an example of association by similarity, "the innermost germ of all association of ideas." I see an apple on the table before me, and quickly find myself thinking of Adam and Eve. Undoubtedly this is, as Höffding says, because I have—perhaps so quickly that I do not remember or am "hardly conscious of it"—first thought of the apple on the tree of knowledge. But this is not, as Höffding assumes, because the apple on the table, being in idea similar to the apple in the Garden of Eden, has suggested the latter, and so has suggested the unhappy first pair connected therewith. On the contrary, the connection between the perceived apple (*i.e.*, certain sensation-complexes, with ideas, feelings, and motor accompaniments) has been by long ago repeated mental activities established with the idea and name of "apple." And this idea and name have frequently been contiguous in consciousness with the idea and name of the apple-bearing tree of knowledge, with Eden, and with Adam and Eve. Indeed, "apple" and "Adam and Eve," in the case of many minds, furnish an instance of one of those many associated couples of ideas where the series has suffered condensation; and thus two originally remote members have coalesced, as it were. In the same way is to be explained the other example of the same author, where a vivid memory-image of a Swiss mountain view was aroused by the "resemblance" of "heavy banks of clouds in the horizon." Here, too, the perceived outline of such forms as the clouds furnished had been previously connected in apperceiving consciousness with the mountain forms. And indeed, Höffding, after affirming that similarity (that is, as a law of association of ideas) lies at the

[1] See his Grundtatsachen d. Seelenlebens, pp. 102 ff. [2] Outlines of Psychology, p. 157.

root of contiguity, and yet claiming independent value for contiguity, proceeds to maintain that the "two laws may be brought under one and the same fundamental law." This law he awkwardly calls the "law of totality;" while rightly holding that it is furnished by the "synthetic activity of consciousness." Now, it is this same law which we have called "the principle of association by previous contiguity in consciousness," and which we affirm to be the one psychological principle underlying all the mechanism of successive associated ideas.

Each particular Case of Association constitutes a special problem to be solved under the general laws of the mind's reproductive activity. Since all the terms in which these laws are stated are figurative, the so-called "laws" must themselves be taken somewhat loosely, in accordance with the facts of mental life. Strictly speaking, no complex idea is the same as, or exactly similar to, any previous presentation of sense or of self-consciousness; neither is any idea exactly similar to what we are pleased (very inaccurately) to call the "same" idea. On the contrary every new reproductive process is also a new mental creation—the origin of which, as a whole, and of all the discernible elements of which, depends upon many influences. Of these influences the more important and determinative can sometimes be observed or conjectured with a high degree of certainty. But at other times the origin of a complex idea may be quite hidden among the deepest secrets of the forgotten past of the mental life. Under the general principle, however, the causes which determine each particular case of a reproduced associated idea are: (1) the conditions under which the original presentation occurred; (2) the history of the mental life, as bearing on this particular idea, from the time of the presentation to the time of reproduction; and (3) the conditions under which the process of reproduction occurs. But who does not at once see that we have here involved all the past history and habit of the ideating subject?[1] In other words, *the answer to the question, why I have just now this particular idea rather than some other, may have to be sought at the very roots and all along the growth of my entire mental life.*

Following are the principal groups of influences which may be seen to enter, with more or less force, into the solution of each case of the reproduction of associated ideas.

§ 18. In any attempt at complete explanation of a case of association we are obliged, not only to go back of the present state of conscious ideation and explain this by previous states; but even to go back of all states of con-

[1] For experimental proof of such a statement, see Scripture: Ueber d. associativen Verlauf d. Vorstellungen. Compare, especially, the declaration, p. 87 f.

sciousness and explain (*A*) by an assumed "nature," or "constitution," of the mind. In this way we take note of the common and apparently well-grounded impression, that not *all* the differences in men respecting their tendencies to associate ideas in a particular way are acquired. Such tendencies as may be called "natural" are, however, undoubtedly connected with differences in the intensity and variety of the original presentations, and with the distribution of attention in connection with discriminating consciousness, etc. But here we reach the bounds where empirical science must stop. This general but vague conception of original differences in men, as furnishing conditions to the associated processes of ideation, is capable of subdivision, as it were. Hence association of ideas may be said to depend (*B*) on temperament, race, sex, etc. Indeed, the speed and character of the individual's train of ideas are distinguishing marks of the acknowledged different kinds of temperament. Terms of temperament (sanguine, sentimental, phlegmatic, etc.) seem not inappropriate to different races of men; and strong reasons exist for admitting that there is much truth in the popular impression of a characteristic difference in the way in which the memory and imagination of men and of women "work"—as we are wont to say. Time of life is also a potent influence in determining the mechanism of associated ideas. The vague longings and sentiments which spring up at puberty, the consolidated practical issues of middle life, the tendency to remoter reminiscences which old age develops, are connected with and express this influence. For (*C*) the transient or permanent influence of bodily conditions and of the corresponding mental moods is very marked over the association of ideas. Psycho-physical depression constitutes a strong tendency to revive certain classes of ideas to the exclusion of others. On the other hand, we *think of* gay things exclusively, or most readily, when *we* are gay. All the imagery of Milton's L'Allegro and Il Penseroso, for example, from the "tripping" on "light phantastic toe" of the one to the "dim religious light" of the other, is ordered and suggested according to an appropriate prevalent mental mood.

The three foregoing classes of conditions—it will be noticed—do not contradict the principle of contiguity in consciousness, but rather afford reasons for the preference of one association over another, when both of two possible associations might have had an equally strong connection established in previous experience. One follows rather than the other, because it fits in better with the present general character of the stream of mental life. But (*D*) what may figuratively be described as the strength and enduring quality of each original presentative state, has its influence on the future association of ideas. Here again the influences which determine strength and endurance are manifold; they are in the main such, however, as have already been considered in connection with primary attention and with the intensity and life-likeness of mental images. Many strange experiences occur under this principle. Trivialties not infrequently get themselves connected with the original leading presentations in such a way as to be forever indissolubly associated. In general, however, the more intense, complete, and interesting is any complex association as established in the presentative act, the more do all the factors and objects thus associated tend to revive each other, under the general principle of contiguity in consciousness. It is (*E*)

the next preceding state of consciousness which, as a rule, has most obvious influence in determining what the particular associated idea shall be. Indeed, the meagre, old-fashioned form of the theory of association laid almost the entire stress of influence upon this immediate connection. We have seen that this account is too meagre to be satisfactory. At the same time, the considerations summed up in the principle of contiguity chiefly apply to the two states thus most immediately associated in the succession of time. (*F*) Repetition and Habit are of the very highest importance in the explanation of the mechanism of ideation, as well as in the explanation of all our mental life, with its voluntary or involuntary and unconscious motor accompaniments.

Finally, we are obviously about to overstep the boundaries of a mechanical theory of the ideation-processes, when we notice (*G*) the great influence of feeling, desire, and volition on the association of ideas. Feeling, in the form of permanent or transient "mood," or "disposition," has been seen to be an important determiner of the succession of associated ideas. The influence of desire and volition has also been recognized, while considering how discriminating consciousness, as a selective and assimilative process, actually accomplishes the association of various factors and objects within the unity of the field of consciousness. We shall subsequently see that, in all association of ideas in developed mental life, there is a possibility of planful choice, with ends of one kind or another in view, taking part in, or assuming a large control over the succession of revived images. Thus, what is customarily called the association of *ideas* comes to be something far more than an unalterable activity in combination on the part of a merely reproductive mechanism, strictly predetermined for each new case by what has taken place in the past. Voluntary memory and free artistic imagination are seen to be possible; and the automatism of ideation, like the motor automaton which the bodily members constitute, becomes not simply the master, but also in some sort the servant of chosen and ideal ends.

In preparation for that service which the processes of ideation render to the development of mental life, changes in the character and connections of the associations take place which may figuratively be described as the "Freeing" of the Ideas. To understand this, what has already been discovered respecting the nature of the representative images, as well as respecting the character of our experience in reproducing series of ideas, must be recalled. Different so-called ideas differ, when compared with their originals and with one another, in respect of intensity, life-likeness, etc. This capacity for difference fits the reproduced ideas for service in two opposite directions: (1) The more intense and life-like any representative image is, the better fitted it is to represent just that particular presentation or previous idea, *like* which it is, in all the fulness of the life belonging to both; and the less fit it is to represent any other of the many particular experiences of mental life. On the con-

trary, (2) the paler, less full in content, less life-like any idea is, the more it is lacking in fitness to represent any one particular presentation; but the better fitted it is to represent any one of a number of more remotely and slightly similar representations. Now, this more extensively representative, or sketchy and outline character of some ideas is essential to the development of mental life; for it enables the "same" idea (or rather similar ideation-process) to represent a number of different (and actually very dissimilar) presentations. It renders the idea "generically" representative. The capacity for generic representation may be said to be due to the more or less "schematic" character of the representative image.

Here it is important to notice the effect of repetition of similar psychic activities, whether in the form of presentations of sense and self-consciousness, or in the form of ideas. Repetition may tend to modify the processes of ideation in either one of two opposite directions. What we frequently perceive—if this be done with interested attention directed to the mastery of details—is likely to be reproduced with fulness of content and in intimate association with a great variety of presentations and ideas of other objects. But what we frequently perceive—if this be done with no attentive interest in details—may become capable of reproduction only in scant outline by an effort, and with some special suggestion to set the mental train in that particular direction. To illustrate both classes of effects—many men who can with difficulty reproduce the arrangement of their own breakfast-tables, or the patterns of the dresses now worn by the members of their own family, recall in a vivid and detailed fashion the aspect of the table at some banquet of a year ago, or the gown of some lady met with on only a single occasion.

From the clear and full perception of objects to the most "abstract" ideas, so called, of those same objects, there is a gradual diminution in the number of discernible elements, and so in the reciprocal influence of the elements upon the entire field of consciousness. The more elements partially or wholly suppressed, as it were, the "paler" and more "abstract" the resulting ideas become. Not only is it true, as one writer[1] has declared, that the strengthening of ideas by repeated production must be harmonized with the fact of the weariness produced by all exercise of mental force, and that one may reproduce an unclearly apprehended idea a thousand times without making it any clearer; but it is also true that, by repetition, the many weaker accompaniments of the few central features of the idea

[1] Beneke: Pragmatische Psychologie, p. 60 f.

may be wholly lost, and that the idea is by frequent repetition rendered more abstract, meagre, and schematic. This is, however, the very process which is necessary to set it "free" from its fixed association with only one original, and thus render it "at liberty" to represent equally well any one of a number of originals. *The less life-like any idea is, as compared with any one original presentative object, the more service it can do in representing an entire class of objects.*

The recurrence of the more highly schematized representative images in a variety of different series operates still further to set them free from fixed and definite limitations. That which, by its concrete and rich life-likeness is capable of representing only one object, is comparatively infrequently suggested to my mind; conversely, when it occurs in consciousness, it suggests comparatively few associated ideas. But experience, to begin with, is not fixed. Series of sensations and feelings and presentations of sense do not perpetually recur in the same order. However hard we labor to master any particular series, it rarely fails to get broken up again by repeated blows from changing experiences. Similar perceptions succeed each other, now in one order and now in another; disposition, bodily condition, transient mood, as well as environment, are constantly changing. To use Mr. Bagehot's expression—the "cake of custom" is perpetually being made and broken, only to be made over in a different way and then broken again. Series of presentations and series of ideas representative of presentations cross and recross each other in bewildering complexity. Thus an increasing variety of more or less flexible associations, among more and more highly schematic ideas, is made possible. This entire complex process, which we have figuratively described as that of "freeing the ideas," may, therefore, be said to have two connected phases: (1) The individual complex ideas (or ideating-processes) by losing more and more of those factors which were fixed by particular previous experiences become capable of representing (are "set free" to represent) a larger number of presentations that are similar only in a few characteristics; and (2) these same ideas, by losing the fixity of position which they had in only a small number of definite series, become capable of association (are "set free" to associate) with a large number of ideas to form new combinations and series. Thus a comparatively strict mechanical association and a relatively free and artistic combination of ideas are both made possible. And both are necessary for the development of mental life.

§ 19. No necessity[1] is more imperative for the first steps in the development of mental faculty than this progressive schematizing of the representative image. In general it may be said that "getting ahead" with our ideas at all requires that we should not stop long over each one. Most of them must be touched lightly and let go; they must not be dwelt upon; for the life of conduct and thought, with its end to be reached, requires us to move on. Few, then, of the factors which have fused into the most life-like form of the representative image can ordinarily be made the subject of detailed reproduction. Thus is made possible all that use of external symbolism, of whatever sort, which suggests and supports the rapidly moving but thin and meagre members of the train of associated ideas. The rude drawings of primitive peoples, the origins of the different alphabets, the accompaniments of grunting and gesturing with which speech is often helped out, the use of signs in mathematics, illustrate this same psychological principle. Indeed the origin and use of language cannot be understood at all without bearing this principle constantly in mind. On the one hand, a single word dwelt upon may suggest a group or series of connected ideas—all, perhaps, of a concrete, intense, and life-like character. But, on the other hand, whole sentences or paragraphs, in rapid speaking or reading, may have for their mental correlates, as suggested by the words, only a small number of highly abstract ideas. Indeed, if we consider, what that is truly psychical generally answers to long series of symbols—verbal or otherwise—we shall be convinced that in rehearsing many such long series only faint traces of ideation stand here and there for a word, or for an entire phrase. If one arrives at the other side of the stream in safety, one does not notice or remember how each floating block of ice felt, as it was touched lightly with the toes—one's eyes and interests being set *on that other side*.

The changes from presentations to ideas, and so on to so-called conceptions, may be said largely to consist in the more and more complete "freeing" of the mental states ("presentations," "ideas" or "representative images," and "conceptions") from the limitations of fixed concrete accompaniments. In the case of some of the senses, however, this process of freeing never takes place to any considerable extent. One can easily represent to one's self, in terms of *sight*, what corresponds to the idea or the concept of a heliotrope or a Japanese lily, but what real psychical process can be meant by speaking of the "concept" of the *smell* of either of these flowers? What, again, can be meant by a concept corresponding to the peculiar *timbre* of a single note (*e.g.*, a') on a cornet, or a flute, etc.? Some persons can undoubtedly ideate somewhat vividly in response to the demand made upon them to reproduce the smell of the heliotrope, etc., or the timbre of the note a'. But the timbre of any note—to select this as an example of many similar experiences—is different according as it is sounded by cornet, flute, violin, etc. The most life-like idea of any note is then probably more abstract than the most life-like representation of the smell of the heliotrope. In both these cases, however, the state of consciousness actually arising in answer to a call for some "idea" of the smell of a particular flower, or some "idea" of the timbre of a note, etc., would probably bear scarcely any traces of revived images of the particular sensations required. It is really in terms of sight

[1] On this necessity see George, Psychologie, p. 222 f.

and motor experience, faintly and "abstractly" reproduced, that most persons construct their so-called "concept" of smells, sounds, and tastes. In general, then, *the more "abstract" and "conceptual" the ideas become, the more do they consist of highly schematized reproductions of presentations in terms of the more intellectual and objective of the senses—that is, of sight and touch*, in the most comprehensive meaning of the latter word.

The difference between the definite and life-like but fixed ideas, and the paler, more abstract, and free ideas, may be illustrated by the well-known case of the somnambulistic abbé.[1] We are told that this man composed sermons during his long-continued states of natural hypnosis, or somnambulism. But one day, when a sheet of white paper was placed over the sheet of writing he had just finished, he obviously reproduced upon the blank page all the mental images belonging to the sheet below; for he read the latter correctly and made erasures and corrections (on the blank page) which coincided exactly with the text. Compare this life-like reproduction of associated ideas with the few and meagre abstract ideas which would be awakened in his hearers when the abbé came to read his sermon before them! Again, a correspondent of Galton,[2] the Rev. George Henslow, on shutting his eyes could see a series of visual images, vivid and concrete, unfolding themselves before him, as a passive spectator, so to speak: for example, a bow—an arrow—hands drawing the bow—a cloud of arrows—falling stars—flakes of snow—ground covered with snow, etc. Compare this form of ideation with that which the reproductive energy of our minds produces as we rapidly read the account of this man's experience. How life-like, but limited, the one associated series; how abstract, but free in association, the other!

§ 20. The process of fixing and then freeing the ideas, in associated groups or longer series, is well illustrated by the experience of the average learner of the art of playing the piano. It is usually very difficult at first to establish a firm association between the two complex series of psychical processes required for "putting together" the two hands. The practice of the particular exercise with which this is in the first instance accomplished has for its result a firm welding of the particular score in the treble *clef* with the particular score in the accompanying base *clef*. This firmly welded complex of two associated series, once made with no little pains, becomes in turn difficult to break. Indeed, in the case of those who learn only a little of the art, it is apt to remain throughout with an astonishing amount of tenacious adherence between its fixed ideas. But the practice of different exercises—the second, after the first has been mastered, etc.—results in repeating the same notes in slightly changed combinations; the series of the treble *clef* is in each case somewhat different, as is also that of the base *clef*. The complex of the two associated series now accomplished is a step in freeing the ideas (auditory, visual, tactual, muscular) concerned in the entire process of learning to play. And finally, in the trained pianist, so "free" have all these ideas become that any possible combination is instantly brought about by a bare suggestion; so "condensed" is the series of psychical acts now answering to the musical symbols that a mere glance at the notes carries with it the

[1] See Binet: La Psychologie du Raisonnement, p. 150.
[2] Comp. Paulhan: l'Activité mentale, etc., p. 480 f.

rush of motor and affective accompaniments, with the palest and most abstract of ideation-processes. And in musical improvisation or composition, the free-mounting ideas, in response to a chosen end or to a flood of not easily expressible feeling, show how the mechanism of association has been made the servant, and not the master, of the feeling and willing soul. In all such experiences we have the principle illustrated that *the power of any fixed association seems, by frequent repetition, to rise to a certain degree of intensity; but from this point on, by repetition, the opposite result may be made the more possible; for the many concrete points of association become weaker and weaker and at last disappear.*[1] In connection with this principle, the repetition of similar presentations of sense or self-consciousness, in a great variety of different connections—pairs, groups, and longer series—favors and accomplishes the progressive freeing of the ideas.

Mechanical as the elementary process of ideation undoubtedly seems to be, clear traces appear in it of that which promises to overstep the bounds of mere mechanism. The whole history of mental evolution depends upon the progressive organization of the elements of mental life under laws or orderly forms of behavior, in accordance with the ends of mental life. Even in the earlier processes of ideation the beginnings of organization are laid. But the very word "organization" (as well as the word "development") is meaningless without the idea of a plan. The association of ideas, as one of the most fundamental conditions of all mental organization, shows tokens of being "planful," even from the dawn of mental life. In this regard mental phenomena resemble all classes of biological phenomena. All living beings, from the very beginning of their observable existence, organize themselves according to a plan. This fact cannot be denied, no matter how much our obvious ignorance as to the explanations of the fact may be increased or diminished by the progress of biological science. A study of the life of the human embryo shows a most marvellous series of changes, the more immediate conditions of which we can only very imperfectly set forth, proceeding, however, according to a recognizable plan. The *planful* nature of this self-organization is the one obvious, the indisputable thing; the exact character and amount of the influence from environment is much the more doubtful and disputable. Thus, also, the mental life, from its very beginnings makes evident that its development is *going to be* according to a plan. Tracing each stage and step of that development, and reviewing its whole course from a point of view selected where the entire course may be regarded as complete, we see that it *has been* according to a plan.

[1] Comp. Mohr: Grundlage d. Empirischen Psychologie, p. 86 f.

In attempting a scientific account of the mental life psychology is justified in laying emphasis, at first, upon the passive, and, as it were, externally determined side of the total development. This side is properly emphasized in any theory of the so-called association of ideas. Thus we may speak as though ideas were somehow forced into association by the play of the environment upon consciousness, through the sensations; and as though, a mechanism of associated ideas being thus externally fixed, this mechanism remained the controlling, or even the only, thing to be considered in all subsequent development. But it must also not be forgotten that from the beginning, and even in the formation of associations, the other sides of the complex of consciousness must be taken into the account. It must not be forgotten that feeling and conation—the interest that goes with pleasure-pains, the varied affective impulses, the influence of selective attention, and the adaptation of motor consciousness to practical ends—are taking their share in the organization of mental life. Nor do these activities stand apart from the forming and development of the mechanism of association. This mechanism, then, is itself made planful, so as to express the entire nature of the developing mind. Such a fundamental teleology of mental activity as a principle controlling the very elements of mental life, has been elaborately discussed by a recent writer on the psychology of association (M. Paulhan, in *L'Activité mentale et les Éléments de l'Esprit*). We agree with this author in recognizing the increasingly planful and "systematic" character of the processes of associated ideation. We shall assume and explain this character in all our subsequent discussion of the development of mental life. To us, as to him, the sentence stands approved: "The mind in itself appears as being essentially a synthetic activity;" . . . "the principal law is a law of finality." But none the less shall we constantly keep before us the mechanism of association as explicable by the principles discussed in this and the preceding chapters.

[The literature bearing on the nature and association of representative images, or "ideas," is well-nigh limitless. In modern psychology, the Herbartians in Germany and the members of the Associational School in Great Britain, as well as the critics of both, have been especially productive of treatises upon this subject. Indeed, by both classes of writers this subject has largely absorbed their entire interest in mental phenomena. Referring the reader, in a general way, to these treatises, we mention, following, a few of the more suggestive recent monographs: Hering: Ueber das Gedächtniss, etc. J. Huber: Ueber das Gedächtniss. Faulk: Das Gedächtniss. Forel: Das Gedächtniss u. seine Abnormitäten. Uphues: Ueber die Errinnerung. Ebbinghaus: Ueber das Gedächtniss. Nichols: Memory. Stricker: Studien über d. Association d. Vorstellungen. Gratacap: Theorie de la Mémoire. Ribot: Diseases of Memory. Ferri: La Psychologie de l'Association. Scriptture: Ueber d. associativen Verlauf d. Vorstellungen; and Vorstellung u. Gefühl. Oelzelt-Newin: Ueber Phantasie-Vorstellungen. Blawaky: Die Vorstellungen, etc. Bastian: Die Vorstellungen von d. Seele. Binet: La Psychologie du Raisonnement. Also an article of Bain, Mind, xii., p. 354 f.]

CHAPTER XIV.

PRIMARY INTELLECTION

FREQUENT use has already been made, in a great variety of connections, of the term "discriminating consciousness." Indeed, it has seemed necessary to assume the presence and influence of such mental activity in treating of all the different elements of mental life; so far as both these elements and the laws of their combination can become data for psychological science at all. For no *science* can, of course, be acquired without conscious discrimination; and, in the confessedly loose way in which we have been using the word, discrimination is the essential thing in all those processes of observation, inference, and experimental proof, upon which science reposes. But it is the science of this very psychical activity, as such activity underlies all science, which psychology aims to investigate. Indeed, from one point of view, the subject of this chapter would more properly be classed under the most general forms of mental life rather than among the elements of mental life.

Two important considerations follow from this view of the mental activity to which the title of the chapter is appropriate. First: Primary Intellection is not so much *a* faculty—in the sense of being a form of mental life separable, at least by a process of abstraction, from other most closely allied forms; it is rather that very activity which furnishes conditions to the formation of every psychosis as related to others in the stream of consciousness; it is the process of elaboration indispensable for the formation of all faculty. Perception, memory, imagination, and all the complex forms of feeling, desire, and will, as truly as what we call thought (proper) and reasoning, involve, and as faculties are developed in dependence upon, "intellection" as a primary mental *activity*. For discriminating consciousness is the necessary accompaniment of all psychoses, so far as they can become objects of knowledge; and primary intellection works at the very roots of psychical life and psychical development. Regarded as activity (and so, pre-eminently it must be regarded), it *is* that form of psychic energizing which ac-

complishes the elaboration of all materials, the organization of all processes and forces, the development of the total life of mind. Second: From this same point of view no state of consciousness, regarded as an object of knowledge (or *datum* for science), can be completely described by enumerating its "contents" simply, and as though they were mere forms of passivity. For every psychosis, however elementary and simple such psychosis may seem to be, *is* something more than the sum of the so-called elements comprising it—for example, such a complex of sensations, such feelings, so much conation, as content, etc. *Every state of consciousness is not only capable of being regarded on the side of passive content of consciousness; it must also be regarded on the side of active "discriminating consciousness."*

§ 1. To illustrate the relation of primary intellectual activity to the entire development of mental life, it is in point briefly to review what has already been seen to be true of all the forms and elements of such life. In treating of consciousness it appeared (p. 34) that what we mean by this term can serve the purposes of knowledge only so far as every state of consciousness is regarded as capable of being *discriminated* with respect to content, and so of being related to the stream of mental life. To speak of "state of consciousness," "circuit of consciousness," etc., is absurd, if this discriminating activity be excluded. So, too, it was found (p. 51) that the very term "faculties of the mind" implies different forms of functioning which consciousness *discriminates* while assigning them all to the one subject of psychical states. In treating of attention and discrimination we often seemed to be regarding one and the same psychical process from different points of view. Although this conclusion would not be quite warranted, the effect of attention on discrimination, and the reverse influence of discrimination in directing selective attention, were made obvious enough (see p. 75 f). So, too, did all the treatment of the quantity and quality of the sensations of the different senses imply the activity of discriminating consciousness. For quantities and qualities of sensations can be called like or unlike, and can be said to vary in accordance with Weber's, or some other law, only as they are made objects of intellection by the subject of the sensations. Moreover, it was shown that discernible differences for each person, whether as respects quantity or quality, are determined not so markedly by variations in the external stimulus, as by the attitude of the discriminating subject toward the induced tendency to changes in the resulting states of consciousness. In treating of the phenomena of feeling, also, some authors were found who hold that all qualitative differences are only differences in the *discriminated* content of the sensations or ideas which the feelings accompany. In maintaining the reality of affective qualitative differences we did not for a moment deny that discernment of these differences, as an act of primary intellection, is implied in all consciousness of such differences. And, finally, it would plainly be quite impossible, and even absurd, to speak of known relations of resemblance and difference between

representative images and their originals (*i.e.*, more or less of intensity, life-likeness, objective reference, etc.) without implying primary intellection as the necessary accompaniment of all the reproductive processes.

We may refer, then, to discriminating consciousness as present in, and necessary to, all the elementary processes of mental life. It is most closely related, however, to the concentration and distribution of attention—in the manner already partially explained. In gathering together, and more clearly stating and expanding, what has already been implied concerning the function of primary intellection in the most elementary mental processes, we are also preparing the way for a descriptive science of the development of mind.

§ 2. The attempt is again being made (as it was formerly made, especially by the avowed followers of Locke in France), to reduce all conscious life to varying content of consciousness; and then to reduce all content of consciousness to sensations and ideas or revived images of sensations. This modern effort at a psychology which shall discharge all its obligations when it has investigated the "what-sort" and the "how-much," of present sensuous impressions and fainter images of past impressions, claims to speak in the name of experiment and induction from facts. But in its more modern form it is as certainly doomed to failure as was the earlier effort; and this rather the more, because the modern science reveals such a vast wealth of psychic facts on which valid inductions must be based. For neither the single state of consciousness, so far as we can catch and separate it from the stream of conscious life, nor the stream of consciousness in which every such state occurs, can be fully described if it be regarded merely as respects its "content" in the narrow meaning of this word. There is indeed a meaning of the words in which it may be said that all which is knowable of the nature and development of mental life is to be found in "the content of consciousness." But this meaning must be large enough to admit the undoubted fact that self-activity and awareness of such activity are of the very essence of every content of consciousness. For the whole of consciousness is never mere passive *object;* but consciousness as *active* and discriminating, consciousness as intellection directed in connection with conative and selective attention, is just as truly consciousness. The observing activity itself (with all that is implied in it) is just as necessary to the sum total of all that the conscious mental life really is, as is the object observed and then regarded as content of any particular determinable part of that life.

Doubtless we are in some sort using terms which may prove misleading, when we speak of intellectual activity by way of comparison, analysis, assimilation, and, finally judgment, as though all this implied a power separable from the definite and concrete contents of consciousness and "presiding over" them. But the most ordinary experience fairly compels us to think of ourselves as reacting upon the mechanism of our own sensations, feelings, and ideas in the form of a relating and determining activity. In the higher stages of mental development all language is constructed and all action shaped *as though* this were so. In those higher stages, so far as the naïve and unprejudiced deliverances of consciousness itself are trusted, everybody *knows* that this is so. That is to say, every developed mind

knows that the whole of its consciousness is not faithfully described in terms that leave out the reactive and relating spontaneity of intellect, which is of the very essence of *mind* in any proper meaning of the word.

In criticism of the popular figures of speech it scarcely need be said that *consciousness regarded as objectively discriminated and possessed of a certain concrete content, and consciousness regarded as discriminating activity, are only two sides, as it were, of one and the same consciousness.* This is true of every psychosis, or state of consciousness. It is also true of every connected stream of consciousness; and of that continuous life-history which we ascribe to each individual person or mind. But different states may appear to lay emphasis on either one of these two sides, to the relative and temporary exclusion of the other. The same thing is true of moods, dispositions, temperaments, persons. All these may be spoken of as more or less "discriminating," and also more or less "rich in content" of consciousness regarded as passively induced state of impression. So do the different developed forms of higher intellection differ among themselves with respect to the relation of the active and passive sides. This is peculiarly apparent when we consider the difference between trains of imagination and trains of thought—popularly so called. In the former we often seem to ourselves to be passive and almost undiscriminating spectators of the shapes that come and go; in the latter, we more frequently appear as discerning managers of the shifting forms, as recognizing the ideas clearly and setting them into relations with one another for the solution of some problem which *we* keep held before the mind.

Respecting the special Physiological Conditions of the activity called Primary Intellection, we have little or no scientific information. That its completion as a psychical act requires a somewhat relatively prolonged and complex excitement of associated cerebral centers, there can be little doubt. As a psychical act it implies the bringing into the unity of consciousness of two or more sensations, feelings, or ideas; and the dealing with them there, as it were, according to relations of similarity or difference consciously discerned. Such a complex and yet uniting nature for this activity is implied when we speak of it as the work of the "elaborative faculty," as "organization" of experience, as "relating activity," etc. To this elaborateness of the process on the psychical side, something of a corresponding elaborateness may well correspond on the side of the physiological conditions. That is to say, the physiological conditions are fulfilled only when two or more cerebral processes, belonging to different areas of the brain, are united by spreading over the connecting association-tracts, and so forming a larger unity (?) of combined cerebral excitements. But all this, besides being confessedly to a large extent conjectural, throws little or no light upon the nature of the distinctively psychical activity.

Indeed, it is just its *intellectual* character—its real being, as an activity of discriminating and relating consciousness — which does not get taken account of at all in our most enlightened conjectures as to the underlying cerebral processes.

§ 3. The proof for such statements as the foregoing has been, in part, adduced in other connections. It is one of the most important conclusions from the study of the effect of lesions in the nervous matter of the cerebral hemispheres that the *intellectual* quality of the psychical processes may be chiefly affected in this way. Thus the animal, whose so-called visual centers and association-tracts are largely impaired, may still be capable of having all the visual sensations; but their intellectual quality, as dependent upon discernment and recognitive memory, is relatively lost. Such an animal often becomes, at least temporarily, "soul-blind," while still retaining the power to "see," in a lower meaning of this word. In certain forms of aphasia the patient may be able to hear all forms of language as mere sounds, while discernment and recognitive memory being impaired, the sounds may lack sense and no longer be heard as words, in the fuller meaning of this term. We have already seen (p. 68 f.) that attention with discernment requires prolonged time in reaction; and this implies increased expenditure of cerebral energy; moreover a smaller number of objects exhausts the grasp of consciousness, if the amount of discriminating consciousness allotted to each be increased. Complex associations accompanied by discernment—as in translating and naming words—requires lengthening of reaction-time. (See p. 267 f.) The same truth is apparent, if the following results obtained by requiring various forms of increased intellectual activity be compared with the simpler and less intellectual reactions. For example, while the time required for simple reaction varies from 100 σ to 200 σ, counting single letters requires 317 σ–530 σ; counting letters by threes, 209 σ –440 σ; adding pairs of numbers, 754 σ–1,533 σ, etc.[1] As we should suppose, also, experiment shows that the time increases as the number of objects is increased among which discernment is required. Certain experiments showed that the average time required for this simple act of intellection rose from 290–344 σ to 817–1,197 σ, as the number of colors or letters, one of which was exposed for recognition, increased from one to six. [Experiment also shows that practice may so improve the speed of discernment as to reduce the time required for it almost or quite to zero. In such cases, perception and apperception may be said to fuse into one process. Or, popularly speaking, we know the thing *at once*, and do not have to think or remember *in order* to know what it is.]

"Psychical reflexes," or "reflexes with cognition of the excitant" (so Richet), in general, therefore, require increased psycho-physical time; and this is indicative of the requisite elaboration going on in the cerebral centers. In the same direction points the fact that Ebbinghaus found a greatly increased number of repetitions necessary in learning his series of non-sense syllables, if *recognition* of the series was to be secured which would last even to the following day. Even 8–16 repetitions would not secure this; from 53

[1] See Axel Oehrn's Inaugural Dissertation, Experimentelle Studien zur Individualpsychologie, Dorpat, 1889.

to 64 repetitions were sometimes required. Yet, as has been said already, discrimination or primary intellection itself is a unique form of *psychical activity;* it is implied in the development of all the faculties, and, *as such*, is something over and above the varying qualities and intensities of sensations and feeling, with their kinds and amounts of correlated physiological conditions in the form of conjectural brain-processes.

On attempting further Analysis of the activity called discriminating consciousness, or Primary Intellection, several "moments," or possible aspects, of it are discovered which must be taken into the account. In its rudimentary and primitive form all intellection is, indeed, essentially one active process; and this, its essential nature, we have attempted somewhat loosely to indicate by the word "discrimination." But, on the other hand, several processes are involved in the simplest act of discrimination; or, rather, we may look on this activity as comprising within itself several partial processes. Of these the most significant and clearly fundamental, perhaps, is the *consciousness of Resemblance.* By these words ("consciousness of resemblance," or of likeness) a transaction in the mental life is indicated that is itself totally incapable of further analysis, or even of description. It is itself, indeed, the very precondition and the constant accompaniment of all analysis; and the term description has no meaning without both implying and appealing to this conscious activity. If, however, we choose to change our terms, we may say—*the immediate awareness of resemblance is the first, and it is the constant, form of intellection necessary for all elaboration of experience, for the most inchoate organization of mental life.* Nor need we be disturbed because we have reached here a limit to all our work of analysis.

It should never be forgotten that the "resemblance," or "likeness," of which psychology speaks, is to be considered from the *psychological* point of view; this point of view regards only the phenomena of consciousness, as such. Resemblances of things, regarded as objectively determined by processes of experiment and inference, are all—psychologically considered—reducible to resembling psychoses or states of consciousness. Psychologically considered, that *is* like which *seems* to be like; in other words, it is the immediate awareness of resemblance which constitutes the very nature of this unique form of psychical activity. Even where the objects which appear to be like are exceedingly complex, and therefore have many more or less prominent points of unlikeness, and where the awareness of their resemblance is reached only after complicated processes of comparison and reasoning, the essential nature of this psychical

activity is unchanged. It follows from this that I may be conscious of resemblance where another is conscious of difference; and that presentations, which at one time awaken in me the consciousness of resemblance, may at another time awaken in me the consciousness of difference. So far as the psychological point of view is strictly maintained, *things are what they seem*—to each and every subject of conscious states, and in every state of consciousness which presents, remembers, imagines, or thinks them.

In this same connection it should also be noted that the having of like states, or factors of states, whether within the circuit of one consciousness, or in close succession, does not in itself at all explain the immediate awareness of their likeness. *Consciousnesses that resemble each other cannot—simply by being compounded or brought into juxtaposition, as it were—account for the consciousness of resemblance.* On the contrary, the declaration that the consciousnesses do resemble each other has no meaning or validity, unless we introduce some consciousness of resemblance belonging to some subject who is actually active in regarding the resembling consciousnesses in an objective way. For the consciousness of resemblance is always something over and above the resembling factors or states of consciousness: not "over and above," however, as separable from the factors or states; but as an active process necessary to be recognized in order that we may understand how such factors or states come to be regarded as resembling, by the very consciousness whose they are. It is the more necessary to insist upon this, because not a little psychological theory has gone upon the absurd assumption that the consciousness of resemblance has been accounted for, whenever an account has been taken of the presence of resembling factors or states of consciousness.

To adult consciousness resemblance seems to imply *Difference* as equally primary; and the discernment of unlikeness would therefore seem to be implicated in the discernment of likeness. The very words "likeness" and "*un*likeness" appear as correlative terms. And if he could have no discernment to whom nothing were like anything else; he would be equally lacking in the fundamental requisites of discernment, to whom nothing were unlike something else. Do not the physical sciences continually point out that every object is, in some respects, like every other, while no two objects are precisely alike? There is important truth for psychology in this somewhat finical way of stating the conclusions of the physical sciences. *The consciousness of difference is indeed indispensable to the development of*

intellectual faculty, to the organization of mental life. And in fact, consciousness of resemblance and consciousness of difference go hand in hand, and usually *pari passu.* The latter, too, is a necessary process at the very beginnings of intellection, an important "moment" in all, even the simplest, completed discrimination. Nor can any possible manipulation of unlike psychoses, or factors of psychoses, by placing them side by side or causing them rapidly to follow each other, account for the consciousness of difference, the immediate awareness that the factors, or states, are unlike.

At the same time, the consciousness of resemblance and the consciousness of difference do not stand in precisely the same relation to the total process of primary intellection. Of these two, the most vague and inchoate consciousness of resemblance may be said to be the more fundamental, all pervasive, and essential for even the beginnings of intellectual life. Neither experiment, nor such analysis of our intellectual activities as introspection can make, warrants the conclusion that in order to recognize likeness we must always also concomitantly recognize unlikeness. The grasp which the mind lays upon the similar, and the accompanying feeling of pleasurable, recognitive interest, together with the instinctive and rapid assimilation of what is thus recognized into the life-blood of the system of experience, seems to be the logically, if not also chronologically, prior—as it certainly is usually the most distinctive—form of intellectual activity. Speaking somewhat loosely, then, we may say that the most primitive consciousness of resemblance does not necessarily take account of difference; the awareness of likeness is the most fundamental thing, and the awareness of unlikeness rather follows as the result of a shock, or check, to the process of assimilation by consciousness of resemblance. This "shock," or "check," usually, if not uniformly, comes as the result of some form of inhibitory feeling. It is regularly of a more or less painful character; it sounds a call of warning, or a summons to "look again;" it involves thus an arousement of attention, and the direction of attention differently, on account of a different kind of interest. In developed consciousness the fact is perfectly familiar that noticing differences is largely the result of our being somehow made aware that we have been mistaken in a too hasty assimilation of what was formerly experienced under the consciousness of resemblance. In primary intellection there is evidence that the case is somewhat the same.

§ 4. The attempt to resolve the consciousness of resemblance and the resulting idea of "the similar," into anything more simple or elementary, must, of necessity, always fail. Our notion of "the same" or "the identical" (and, indeed, all the ideation and feeling which we connect with whatever affirmations we make of the identity of things, or even of our own personal identity) is of course, derivative and complex. *The cognition of the similar is the ground of the cognition of the same; and not the reverse.* Since those external objects, or states of our own self, which we regard as similar in our developed experience, are always complex, their complexity includes discernible points of difference as well as of resemblance. To speak of them as similar, then, implies a limitation of the activity of discriminating consciousness to certain elements of this complex. Thus, if we are considering the total object, or state, with a view to select also the points of difference, we feel obliged to sum up the results of the entire process of comparison in the conclusion—"similar only in some respects." But if the inquiry be pressed to its furthest possible limits and the question raised, What is it that is meant by the word similar as applied only to those points which *are* similar? no reply can be given, except to describe over in another way this fundamental, unanalyzable activity of intellect—the consciousness of resemblance, of the similar as such.

In all the more elementary forms of its exercise, this primary intellection is undoubtedly very vague, uncertain, and fitful. The similarities noted are taken "in the lump," and more than half blindly as it were. They resemble that likeness of the color which all "cats" and all other objects have "in the night." Indeed, in its most primitive form such intellection may be spoken of as consciousness *of similarity*, without added consciousness as to *similar in what respect.* Nor is this half-blind form of conscious intellection so very foreign to the experience of waking adult life. Thus there are many acts of discrimination which all perform that are almost as vague, uncertain, and fitful as are those which may be supposed to occur in the earliest mental life of the infant. A faint and wavering grasp of conscious mentality, striving, somewhat doubtfully, to assimilate a certain sensation-complex or idea, is not infrequently all that marks the intellectual side of certain of our psychoses. Thus we sometimes awake from a half-dozing condition, or from a day-dream, or from absorption in thought over some problem, and say: "Did I not hear something *like*—a sigh, the rustle of a dress, the dropping of the eaves?" or, "Did I not see something *like*—a bird, a hand, etc., pass before the window?" It is not without significance that men are inclined to use terms of *feeling* rather than of intellect to describe such consciousnesses of the similar. This is true of the terms which serve us for the various degrees of conviction attaching itself to the discernment of likeness—all the way from "feeling a little as though" to "feeling sure." On the other hand, where discriminating consciousness has been so highly trained in immediate awareness of likenesses and differences as to amount to an admirable tact, we incline again to resort to terms of feeling to describe what is really of the very essence of intellectual life. Thus the locksmith feels his way to the picking of the lock; and afterward experiences an insuperable difficulty in putting the results even (not to say the grounds) of his rapidly forming acts of discernment into terms of judg-

ment. Extremes meet here; and the artist sometimes finds the strictly intellectual content of his consciousness almost as meagre as that of the child.

It should also be observed at this point that all consciousness of similarity implies *at least two* similar factors, or states, of consciousness, of whose similarity the immediate awareness may be. Such primary intellection does not, of course, imply the act of counting, or the ability to count—not even up to the low limit of two. On the contrary, it must itself exist in a somewhat developed form, as the necessary prerequisite of all counting. Both the consciousness of resemblance and the consciousness of difference may be rather highly developed, whether in animals or in men, with little or no ability to count, in the strict meaning of this word. We have already seen (p 147 f.), that the most primary consciousness of motion develops in connection with a change from one complex of sensations to another. Thus, also, it is only on condition that one state of consciousness is actually brought into relation with another, or one element of the same state with another element by a change in the focusing of attention, that the activity of primary intellection can take place. These points have led Mr. Spencer[1] and others to speak of the activity which we have called primary intellection as though it were a "feeling" interpolated "between" two sensations—a sort of feeling-conscious of a transition from one (either like or unlike) psychosis to another. Now that certain peculiar feelings do accompany all kinds of changes in the stream of consciousness, whether its content be mainly one of sensation or one of ideation, is undoubtedly true. But instead of the consciousness either of resemblance or of difference being a "feeling," in any proper sense of that word, no particular feeling can itself exist for consciousness without implying at least a trace of this discriminating activity. And, moreover, there is really no such "between" into which this falsely so-called "feeling" may be interpolated. The stream of consciousness flows on, as we frequently say; and as it flows, regarded as discriminating consciousness, it *is* an immediate awareness of its own like or unlike states.

§ 5. The activity of primary intellection, like all developed intellectual activity, is obviously dependent upon the affective side of consciousness. Discrimination, even in its most primary forms, *is* not feeling; but it is roused, guided, and accompanied by feeling. The discernment of resemblances is stimulated by the pleasure-pains connected with our sensations and presentations of sense, our mental images and thoughts. The familiar tone of feeling which cleaves, as it were, to the content of consciousness, both excites and guides the activity of consciousness as discriminating. Witness the signs of pleased recognition with which the infant greets the sight of its nursing mother or nursing-bottle, or its "self-same" familiar toy; or, again, the signs of fear and displeasure produced by the preparations for its bath or dose of medicine, or by some object like that which has formerly given it discomfort. Here full intelligent recognition by no means precedes the affective development of consciousness; the rather does feeling begin by co-operating with, and urging forward, the more vague and uncertain beginnings of discriminating consciousness. *The unrecognized similarity of feeling stimulates the intellectual consciousness of resemblance.* In awakening the beginnings of such primary intellection, nothing is more effective, for

[1] Principles of Psychology, I., Part ii., chap. 2.

example, than to direct the attention upon a rhythmically recurring series of pleasant sensations. The croonings of the nurse, the rocking in arms, the repeated strokings of the skin, the movements to and fro of any bright object, the successive efforts at swallowing food or grasping with the hand, etc., are all means of starting and developing the consciousness of resemblance. These operate, of course, prior to any consciousness of time, or of self; and prior to any knowledge of things. They are rather the rudimentary experiences, out of which, in part, all such higher forms of consciousness must develop. Over and over again the similar recurs in consciousness, at a time when clear cognition of complex similars is impossible; and accompanying pleasure-pains allure or compel the child to pay attention and to learn to discriminate.

On the other hand, *any considerable abrupt change in the content of the stream of consciousness, especially when accompanied by a shock of surprised or painful feeling, stimulates and directs the consciousness of difference.* Indeed, it may be said that the entire environment of the infant, however carefully guarded he may be, is calculated to make him *mind* the differences really belonging to what, without this special process of "minding," would be considered the same. His mother's breast, or his cup of milk, may any day excite, only afterward to disappoint, his pleased recognition of the familiar object. The bitter taste designed to wean him from the one, or the lack of the customary amount of sugar in the other, emphasizes the dawning consciousness of difference. Herein are laid the very foundations of many of the most bitter as well as some of the sweetest of life's experiences—summed up in the pertinent warning that "things are not what they seem." The smoothly running current of consciousness, which keeps repeating a largely similar content, is not adapted to train man in the discernment of differences. But nature and our fellows provide an abundance of obstacles to perturb and check the running of that stream. The small boy who is *not* greeted with quite the familiar complex of sensations, when he reviews his hoard of candy or of coins, is at once strongly inclined to regard this present content of consciousness with a "critic's eye." It is his interest in the size of the hoard, and in the meaning for his affective consciousness which its size has, that sets discriminating consciousness more thoroughly at work to determine a problem in differences.

That complex activity which we call "comparison," and which ends in judgment, is frequently introduced with the peculiar pause in the flow of discriminating consciousness with its accompanying tone of feeling, which we characterize as *doubt*. In the case of the aforesaid small boy, if the amount abstracted from his hoard were too small for immediate and confident awareness of difference, such a feeling of doubt would be certain to emerge. And nothing could be more favorable to induce an unusual activity of the relating activity, as dependent upon both consciousness of resemblance and consciousness of difference.

§ 6. Discriminating consciousness applies itself to the content of consciousness—to sensations, feelings, and ideas—as respects both their quantity and their quality. It is itself a consciousness of resemblances and of differences, both as respects the kinds and the intensities of the states of consciousness or of the factors of such states. This is true both of sensa-

tions and of those different ideation-processes which represent their so-called originals with various degrees of intensity and life-likeness. The foundation for our perception of motion was seen to be laid in the changing, as respects intensity and local coloring, of certain sensation-complexes.

In considering the primary intellectual activities we are in danger both of over-estimating and of under-estimating the amount of truly *intellectual* work involved. Conscious detailed discrimination of various possible points of resemblance and difference is by no means necessarily implied in the prompt recognition of even minute variations of quantity and quality. Such recognition often proves quite unable to account for itself when asked to disclose the data on which it has taken place. Hence the tendency (already referred to) to speak of such intellection as the "sensing" or "feeling" of likenesses or unlikenesses. The astonishing discrimination of children and of the lower animals is to be accounted for in this way. Thus the crow, of which Romanes—borrowing the statement of Leroy—tells, which was not deceived into being shot until five or six men (of whom all but one came out) were sent into the watch-house, neither "counted" as the latter writer supposes, nor had "ideas of *number*," as the former writer affirms; it simply made, under influence from interest, one of those vague quantitative discriminations to which we are now referring. Binet's experiments prove that a child of from four to six years old will discern promptly the difference between a group of 14, 15, or 16 and one of 18 objects, of the same size; and will even discriminate between 17 and 18 objects correctly, eight times out of nine trials; while as yet it cannot count beyond three, and pronounces 10 large objects "more" than 18 small ones. And Preyer has shown that one may train one's self to discriminate accurately up to 20, or even 30, objects, when exposed to view far too briefly to count them, or to bring them under any definite idea of "number." [1] In the prompt discernment of qualitative resemblances and differences, also, a very low grade of intellect will often display wonderful results. With these facts (we repeat again) the mysteries of instinct, tact, and what is called "genius," are connected. But on the other hand, to deny totally the *intellectual* character of these activities, and to resolve the phenomena into "feelings" interpolated between sensations, or into self-discriminating sensations, or into passive association of ideas, is equally unwarrantable.

The attempt to describe the character of the object earliest known (the *primum cognitum*), and of the processes of knowledge which result in this object as their product, has taxed the ingenuity of psychologists to its utmost limits. The data for giving such a description with much confidence probably do not exist; and, if we follow the exigencies of theory, we cannot avoid taking the standpoint of adult developed consciousness from which to view the very beginnings of all conscious knowledge. Thus, with respect to the special question: Which precedes in the cognition of objects—the consciousness of resemblance, or the con-

[1] Sitzgsbr. d. Gesells. f. Medicin u. Naturwissenschaft, 29 Juli, 1881.

sciousness of difference, assimilation or differentiation, synthesis or analysis? It would seem that objects cannot be known as *like*, without differencing them from each other as different "like" individuals, and from other objects, in some respects, at least unlike to them. But then, on the other hand, how can objects be discerned as *unlike*, unless some previous experience, in the form of consciousness of resemblance and assimilative activity, has given a standard from which they may be recognized as "differing," or departing? Plainly, these two legs on which the early intellect moves cannot get, either one, far in advance of the other. And yet, if we are to speak of the logically, and possibly the chronologically, prior form of discriminating consciousness, we must assign that rank to the vague and inchoate consciousness of resemblance. At any rate, it would seem evident that the consciousness of difference, and the resulting act of differentiation, implies the higher form of intellectual activity.

Several important considerations are involved in the foregoing view of primary intellection. And, first, those psychical processes which were described as primary attention and as ideation, are necessary to all developed activity of discriminating consciousness. The immediate awareness of resemblances and differences accompanies and depends upon that constant focusing and redistribution of psychic energy which constitutes the very essence of primary attention. If the attention is of the so-called involuntary or forced order, then we may say that the factors of the state, or the total complex states, of consciousness *get* (passively) discriminated. Primary intellection, which is the active discriminating side of consciousness, may then be regarded as dependent upon the intensity of, and upon the interest attaching itself to, the content of consciousness. Thus discrimination itself may sometimes be involuntary or forced; popularly speaking, *we cannot help* noticing the likeness or unlikeness of the object to which attention is drawn. But when the conative aspect of consciousness becomes prominent, and attention is voluntarily rendered, then the resulting activity of discrimination may also be said to be voluntary. Popularly speaking, *I discriminate*—as though the object were somewhat existing apart from the activity of discrimination itself (even when my own feelings and thoughts are the object); and as though this activity were dependent upon another activity called volition. Of course, in employing these different ways of describing our experience, we are only laying emphasis upon one element, or phase, or aspect, to the partial exclusion of others, in the living and manifold movement of psychical life. *Dis-*

crimination is always more or less attentive; and without attention, and dependence upon attention, there is no intellection at all.

Nor is the development of intellection possible without ideation. The relation of ideation and intellection is provided for in the very nature of the stream of consciousness. One may, indeed, try to think of any field of consciousness as a stationary affair, consisting of so many ready-made objects, and of the intellect as wandering over the field and selecting resemblances and differences in its objects, under the guidance of interested attention. But this is to employ, in a figurative way, one's highly complex and elaborate experience (when, for example, one goes botanizing, or geologizing, or exploring ruins) to account for that which is most fundamental and simple, in the very constitution of all mental faculty. No field of consciousness is stationary; nor are its objects ready made; nor is the intellect a separable entity wandering about hand in hand with attention, like two boon companions bent on discovery. But in the one field—with all its objects growing into or passing out of their place in the one field—discrimination, attention, and ideation are simultaneous and mutually conditioning processes of the same mental life. Yet from the point of view of psychological science, the mental images are secondary conditions of the development of discrimination. The very words "*re*presentation," "life-*likeness*," and "association by *similarity*," imply this. Different individual sensation-complexes, or feelings, or thoughts, as well as complex objects of sense and self-consciousness, could not be compared, and so be known as like or unlike, if they were not capable of becoming ideated. Even when the comparison pertains to the different factors in one field of consciousness, as discriminating and attentive intellection proceeds, these factors appear successively on the way, as it were, to the condition of those paler and less life-like psychoses to which we give the name of ideas. *Our very power to constitute the different mental factors into the unity of one state, into a system of related parts (similar or different in quantity, quality, and local coloring) is dependent upon the influence of ideas.*

§ 7. The interdependence of volition, attention, and the discernment of resemblances and differences, scarcely needs at present additional illustration; and all our subsequent study of mental development will furnish abundant illustration. Indeed, the complex process which is popularly described as "minding" anything, implies and affirms this interdependence. When I am called upon to *mind* some object of sense or self-consciousness, I am summoned voluntarily to attend and attentively to compare one part or trait of that object with other parts and traits; or the whole object with some

other object as respects those qualities in which the two resemble or differ from each other. Moreover, any high degree of voluntary and attentive discrimination usually implies preceding acts of attention of a more passive and less discerning kind.

§8. The first activities of discriminating consciousness are undoubtedly exercised upon the more immediately contiguous contents of consciousness. It is in connection with series of like or unlike sensations and ideas that primary intellection appears; and it appears as an activity of the mind reacting upon two members of a series, so as to bring them into discerned *relation* with one another. Hence the gist of intellection is said to be found in this "relating activity." Were it not for such a peculiar form of my conscious reaction, the different members of any series of my sensations or ideas would have to be regarded simply as capable of being related by *some other* consciousness; but they could never become actually related as content of *my* consciousness. Thus we may say: No external activity or power can compare or relate the psychoses of another's consciousness; each consciousness must, as a relating activity, cognize and recognize its own resemblances and differences of content for its own self. Now the onward flow of the stream of consciousness regarded with respect to its content, cannot be arrested in such a way that what has, but a moment since, been a presentation of sense shall not, in the moment to come, be passing into the stage of representation and idea. In other words, ideation is the necessary accompaniment and precondition of all discriminating consciousness. In the case of sight, Professor James has correctly said: "We may read off peculiarities in an after image left by an object on the eye which we failed to note in the original. We may 'hark back' and take in the meaning of a sound several seconds after it has ceased. . . . With the feeling of the present thing there must at all times mingle the fading also of all those other things which the previous few seconds have supplied." What is here called "reading off" and "harking back" implies the simultaneous activity of ideation and intellection. In all complex acts of comparison the dependence of the relating activity upon representative image-making is obvious. For examples, we have only to analyze our mental procedure when we are given a picture or a signature and asked to tell *whose it is like;* or when we are trying to recall a half-forgotten tune or passage from some poet; or when we are choosing words and thinking out the meaning of similes; or when we are trying to decide whether we will trust ourselves to this piece of apparently thin ice, or will confide in this stranger, or will classify any strange object with the species *A* or with the species *A'*. [The author well remembers how distinctly no fewer than four complex fields of consciousness each involving higher stages of ideation and discrimination than the preceding followed one another in his experience within two or three seconds of time. Standing on the corner of a city street, waiting for a car and meanwhile meditating a lecture, he was aware (1) of a very obscure and slightly pleasant (but mistaken) consciousness of resemblance and of a tendency to raise his hand to his hat; (2) of a less obscure and slightly unpleasant consciousness of difference, and an accompanying inhibition of the rising hand; (3) of a tolerably clear and more distinctly pleasant (but mistaken) recognition of an approaching friend; (4) of a perfectly clear, correct, and detailed recognition

of the person approaching, as a stranger, and the consequent feeling of disappointment and chagrin at being deceived into the wrong set of ideas, feelings, and actions under the circumstances.]

Experiment can, of course, only point out the relations of trains of associated impressions to the discriminating activity of mind, as they occur when both the process of ideation and the process of intellection have already been highly developed. But experiment proves the fundamental relations of these two processes, while it does not justify us in resolving either one into the other. It shows, in brief, that our total ability to handle our impressions satisfactorily depends upon (1) the time-rate of their succession; (2) the complexity of the objects to be apprehended; (3) the character—as respects speed, completeness, and accuracy—of the process of ideation; (4) the speed, completeness, and accuracy of the relating activity itself, of the movement of discriminating consciousness. Where all of these considerations are not rightly balanced, what is called confusion of mind results; and such confusion may be called, with equal propriety and expressiveness, either "confusion of ideas" or "confusion of thought."

The relation of association and intellection is pointed out by those experiments which determine the reaction-time for what is called "question-answer" associations.[1] This time is shortened, as we should expect, when tolerably fixed associations are allowed to have free play; or when the relating activity is partly got through with, as a preparatory process in connection with the attention given to the question itself. Thus while the ordinary association-time was, for two persons, 845 σ and 948 σ, it took the same persons 970 σ and 1,108 σ to name an instance under a familiar general term (that is, to make such a limited or definite association as implies more of conscious active discrimination or thought). Again, in asking a person to name his choice of several different fruits, the time is diminished when the question is arranged as follows: "Apples, pears, cherries, etc. Which do you like best?" For here the act of discrimination is in progress while the names of the objects with which the liking is associated are being read. Popularly speaking, the mind is "made up" by association beforehand, and pronounces its judgment as soon as the low degree of conscious discrimination necessary to apprehend the meaning of the names of the objects is completed.

Among the processes of primary intellection are those which are ordinarily referred to as "Comparison," with its two resulting sides of Analysis and Synthesis; and as well, those which are sometimes called "Assimilation" and "Differentiation." Some low degree, at least, of *differentiation* would seem to be implied in merely having the content of consciousness defined as *such* a sensation, or idea, and no other. And here it may be said that the conception of a "primitive blur" of consciousness, or of a sensation-content that is wholly "undifferentiated" and is no particular sensation (so Mr. Spencer), is probably an unjustifiable

[1] Münsterberg, Beiträge zur experimentellen Psychologie, Heft 1, 1889.

fiction of the psychologist. At best, it is a negative conception and of no help to scientific psychology.[1] At the same time, any such primary awareness of difference must be inexpressibly vague as compared with the clearest subsequent discriminations possible for the cultivated intellect.

Assimilation, as a conscious intellectual process in distinction from the mere fusion or association of factors and states of consciousness that are not consciously related, is also included in the work of discrimination. In its lowest form, however, assimilation simply implies fusion or association accompanied by the consciousness of resemblance; in this form it is automatic as distinguished from voluntary, vague as distinguished from clear, and having to do with only one point of likeness. As says Sully: "If the sensation has been preceded by a like one *shortly before*, the trace of this last assuming especial distinctness gives the peculiar mode of consciousness signified by 'again' or 'over again.'" This sentence just quoted, however, only describes the occasion on which the dawning of this primary intellectual life takes place; in its nature such activity has already been recognized as unique and indescribable by further analysis. Thus assimilation has already been described as *the* most primary process in "discriminating" consciousness (as though *dis*crimination, or *differ*entiation, were itself essentially dependent upon the consciousness of resemblance). But as the association of ideas accompanied by this intellectual process of assimilation proceeds, the mental life becomes organized. Conception, classification, (logical) judgment, (intelligent) recognition, and all mental development depend upon this primary activity of intellectual assimilation.

Comparison—as the term is ordinarily used—involves the act of selective attention, applied successively to one part or quality of an object after another and consciously differencing the unlike and assimilating the like. If this highly complex and intellectual activity be regarded as resulting in the separation of the different like and unlike factors from the totality of the object, it is called "analysis." But inasmuch as it results in bringing together some of these factors to the exclusion of others, and so in constituting a new totality, it is called "synthesis." But the development of ideation along the lines of fusion of ideas, association of ideas and "freeing" (or making more "abstract") of the ideas, has already been seen to imply processes somewhat corresponding to these. *All fusion of sensations and ideas into more complex forms, and all association of ideas—when accompanied*

[1] Lotze has combatted this view. Microcosmus, 1. p. 209 f.

by the conscious fixation of attention upon their resemblances and differences, implies comparison as an analytic and synthetic process. In the earlier forms of relating activity, comparison is vague, uncertain, not consciously adapted to an end, and not under the control of voluntarily selective attention. It is a root, however, out of which comes the growth of intellectual faculty. Therefore we may say that conception, classification, (logical) judgment, (intelligent) recognition, and all mental development depend upon comparison too, as primitive intellectual activity.

§ 9. Some apology seems due for using the term "discriminating consciousness" to cover an intellectual activity which is largely, and perhaps more strictly primarily, a conscious assimilation of the *like*, as like. For—surely—to *dis*criminate (and also to *dis*cern) is to attend to differences. But no other term seems equally well adapted to express on the two sides of assimilation *and* differentiation, all that essentially belongs to the primary activities of intellect. This use does not prevent us, however, from holding that the positive consciousness of resemblance, as established between two "moments" in the complex field of consciousness or two states in the stream of consciousness, is the most primitive and unanalyzable of all intellectual acts. Consciousness of resemblance, awakened in obscure and uncertain form between two factors or states that are separable in time, is necessarily followed, however, by consciousness of difference, under the shock of feeling, as already described. Thus we agree with Sully:[1] "Crude assimilation progresses in advance of discrimination (differentiation). . . . On the other hand, assimilation as a precise process follows, or at least involves, discrimination. . . . While, however, this circumscribes the area of exact assimilation, assimilation reacts upon differentiation."

§ 10. All objects of developed experience—things perceived, or states self-consciously cognized, memories, imaginations, thoughts, plans, etc.—are to be regarded, from the psychological point of view, as complex wholes. As complex wholes, they result from synthesis; and the synthesis may be said to be repeated so often as the objects, whatever they may be, appear in the stream of conscious life. In them all, psychological analysis recognizes the traces of a constructive mental life; the fruits—ceaselessly being finished, and then immediately dissolved—of a living intellectual growth. Psychologically considered, all presentations of sense, no less than the castles-in-the-air constituted by our wildest day-dreamings, all things perceived no less than the phantoms of the night that like thin and ghost-like forms, flit over the fields of fancy, are temporary structures put together by the energy of the conscious mind. In saying this, we are not speaking in terms of metaphysics; we are only figuratively expressing the psychological truth that *mental "objects," as such* (and it is "as such" that psychology regards them), *are capable of being regarded as wholes for scientific analysis, only as we recognize that the conscious activity of the person, whose objects they are, constructs them by a previous synthesis.* Moreover, in the development of mental life, every such act of synthesis presupposes countless still previous acts

[1] The Human Mind, I. p. 184.

of both analysis and synthesis—of a more and more elementary sort, down to the obscure beginnings of all intellectual life.

Some sort of Rudimentary Judgment is involved in the earlier and most primary intellectual processes. It has been customary for writers on logic to describe judgment as the process of uniting two concepts as subject and predicate of a proposition, affirmatively or negatively. We shall subsequently see that, however true this may seem to be of certain logical and formal acts of thought, in the development of mental life the procedure of the mind is actually the reverse of this. For, the essence of thinking is judging; it is thinking that converts representative images into concepts; and concepts have their very psychical being in the processes of judgment which construct them. Furthermore, whole groups and series of judgments seem condensed, as it were, into many of our more complicated acts of perception. Seeing, hearing, tasting, touching, and even smelling, as resulting in knowledge, involve a sort of inference. What is *judged*, or *inferred*, as smelled, seen, heard, tasted, touched, is by far the larger part of these so-called immediate and intuitional processes of *sense*-perception.

The character of those acts of judgment and reasoning which enter into our so-called "immediate" knowledge, can be discussed only later on. At present the following three points should be emphasized:

(1) There is no marked break in the continuity of intellectual development. Judgment never appears as an act which springs forth at once, full-armed, from the brain or the mind—without preparation or warning, and as a complete departure from the old life of merely passive association of mental images or receptivity of sensations. Rudimentary intellection develops from the first—we assert the truth again—in dependence upon attention and ideation. And judgment becomes more and more evidently a conscious process of clearly discriminating activity in relating the different contents of consciousness, along a smooth and continuous course of development. (2) But, on the other hand, true judgment can never be developed out of mere fusion or mere association of sensations and ideas. It is, as a form of intellectual life, a unique reaction upon the content of consciousness—a consciousness of relation as something over and above the mere *being-related*, as this latter fact applies to the succession of contents in the stream of consciousness. (3) Considered as a conscious act, all synthesis or analysis established between two factors, or states of consciousness, involves a species of rudimen-

tary judgment. The rather may it be claimed that the actual synthesis which attentive discriminating consciousness establishes between the different contents of consciousness, considered primarily as like or unlike, *is* rudimentary judgment. Such a synthesizing activity is in its very essence, a judging activity; and out of it all the subsequent life of judgment is to be developed.

In other words, *the conscious affirmation of relations of resemblance or difference between the contents of consciousness is the primitive form of judgment.* Such judgment, therefore, enters into all comparison with its processes of analysis and synthesis. It is implied in all assimilation and differentiation, so soon as these two terms are employed to denote truly psychical and intellectual processes. Such judgment is, moreover, *the* form of mental relating activity which, as it accompanies and gives conditions to all elaboration of mental life and is itself modified in the course of this elaboration, accounts for all conception, logical judgment, and reasoning—in fine, for all that we comprise under the words "thinking" and "thought."

§ 11. The nature of primary intellection, as involving the judging activity of mind, can perhaps best be made clear by reference to the views of a number of writers on psychology. It will be noticed that the following admit the truthfulness of the views just expressed, while expressing their own views in a variety of ways. Thus Dr. Ward [1] follows Lotze [2] in holding that, while only two things can be judged or synthesized at once, since only one movement of attentive discriminating consciousness is possible at a time, the two impressions do not judge or synthesize themselves. The impressions are rather to be regarded as "stimuli" to the act of judging. In this way these writers emphasize the truth that intellection is a synthetic activity—dependent upon attention and associated ideation, and yet something over and above ideation *sui generis*, and incomparable to any merely passive relations, externally brought about, between the contents of the stream of consciousness. Hence Lotze speaks of judging as "a second and higher consciousness," "a new manifestation of psychic energy." Another authority,[3] in expressive but figurative language, calls judgment "a *non-suiting* of the fusion of two ideas which is necessary in order to raise the fusion, as such, into the position of an object of consciousness." That is to say, in judging, the two elements about to be related must be considered as *two*—and *not* already indistinguishably fused into *one* idea—and must also, by the act of judging, be consciously brought together and united under some term of relation (primarily, of resemblance or difference). Still another author,[4] while holding that judgment is not an accidental fact but

[1] Article on Psychology, Encyc. Brit., p. 75 f.
[2] Outlines of Psychology, p. 40 f.; Microcosmus, I., p. 220 f.
[3] Volkmann: Lehrbuch d. Psychologie, II., p. 268.
[4] Binet: Psychologie du Raisonnement, p. 96 f.; 129 f.

a constant process of our mental life, finds the essence of judgment in the "law of fusion." It enters into all perception of objects. "This assimilation of two impressions is the biological property from which reasoning is derived." But in correction of this vague way of speaking, as though *mere* fusion of impressions accounted for judgment as an intellectual activity, it may be noticed that this author only aims to account for "the *mechanism* of reasoning;" the *judging activity itself* implies something more than the existence of the mechanism, acting under the laws of associated reproduction. For here—to borrow an expressive figure of speech—we must recognize not only the existence of the ideas that become "cemented" together, but the "*cement*" that accomplishes this new (and intellectual) form of union (*der Kitt zwischen den Vorstellungen*[1]); this "cement" is no other than that attentive, comparative, and synthetic activity which we call primary intellection.

In the contrary direction, certain authors have doubtless so insisted upon this intellectual and active side of all judgment in distinction from the relatively passive flow of associated ideas, as to require of the beginnings of intellectual life a work, the ability to perform which is itself the result of development. Thus we find one writer[2] maintaining that in every true judgment subject and predicate must be distinguished; each of the two must be especially thought; and the subject must be mentally represented as the fixed point to which the predicate refers. And even M. Paulhan[3] maintains that judgment requires the separation of psychic elements, which have, in fact, fused together (as in naming things, and mistaking of words, by children), and their recombination under rational forms. Judgment, he holds, is therefore "the act by which an abstract element of a complex idea is reattached to a new system of elements." The logical bond between the two states whose synthesis constitutes the judgment is "the aptitude of these two states for co-ordinating themselves in view of a common end." Now in so far as M. Paulhan's statements concern the mechanism of ideas, or the character of the two states which get co-ordinated, they afford no full explanation of the activity of co-ordinating (the synthesizing itself). But the description given by both these authors of the nature of the primitive intellectual process of judging is overdrawn. It is enough to say that if so much were required of the beginnings of all judgment, we could never learn to judge. For "distinguishing subject and predicate," and "thinking" the two, and "separating psychic elements," and co-ordinating them "in view of an end" —all these are elaborate intellectual processes dependent upon a preceding training in primary activities of judging, as the essentials of this process have already been described.

§ 12. Peculiar forms of feeling are the distinctive accompaniment of all intellectual activity, even in the most primary acts of judging. Such are the more obscure forms of those same affective accompaniments of judgment with which developed self-consciousness makes us familiar. Among them are (1) a feeling of mental tension which may take the form of expectation,

[1] See Fortlage: Psychologie. p. 174; and compare Brentano (Psychologie, p. 266 f.; 296 f.) who maintains that in every act of consciousness—however simple it may be, as, for example, the mental representation of a tone—a judgment is included.

[2] Ballauf: Elemente d. Psychologie, p. 114 f.

[3] L'Activité mentale et les Éléments de l'Esprit, p. 109 f.

or of vacillation, or of doubt, etc. This feeling may be regarded as directed either forward from the idea *A* to the idea *B*, or backward from the idea *B* to the idea *A*. For judging, even in its most primitive form, resembles the attempt to solve a problem: Is *A*, which is fading from the central point, the focus of attention in the field of consciousness, like or unlike *B*, which is just now occupying this central point? Or the order of the problem may be reversed; and with the feelings which belong to the pause preceding the act of intellectual synthesis all are familiar. But (2) a vague feeling, corresponding to what we recognize as "conviction"—a feeling intrinsically appropriate to the *affirmation* of resemblance or difference—may also be supposed to set its seal upon the acts of primary intellection. Indeed, so intrinsically appropriate and essential is this peculiar feeling that at least one very acute psychologist [1] has been led to define judgment as "ideating with the consciousness of actuality." By the "consciousness of actuality" is here meant the consciousness that a particular way of ideating is necessary, "must be," or "ought to be." This, then, would amount to a sort of indirect feeling of the validity of the laws of intellectual life. But here again such modifications of feeling as belong with developed thinking faculty must be distinguished from such as are the conjectural but natural accompaniment of primary intellection. [It may be noted in passing that the first class of feelings belong rather to the analytic aspect of the relating activity, and the second to its synthetic aspect; the first are, then, rather preparatory to pronouncing judgment; but the second are the affective accompaniment of the actual pronouncing of judgment.]

§ 13. Let us state the results of our inquiry into the nature of primary intellection in the following way: I may regard any stream of consciousness with respect to its contiguous members, or any field of consciousness with respect to its numerous factors or objects, as simply capable of having its contents described. The contents are, for example, certain sensations, feelings, ideas, conations—*A*, *B*, *C*, *D*, etc. As a matter of fact, objectively regarded, these sensations, feelings, ideas, conations, are related in certain ways; they are more or less like or unlike each other. But now let the question be raised: What new factors, or shadings of old factors, enter into this complex of consciousness as soon as we introduce the conception of intellectual activity in the form of a judgment made by the subject of these sensations, feelings, ideas, and conations? Why, then, a *relating activity* must be recognized; an active consciousness of resemblance and of difference—resulting, by processes of assimilation and differentiation, in a new and intellectual ordering of the sensations and ideas, stirred and accompanied by peculiar feelings, and dependent upon the voluntary focusing and redistribution of attention; and finally, the establishment of laws of rational connection between mental states, which give a new definitive flow to subsequent mental life.

Once more, rudimentary and developing Time-consciousness is assumed as a condition, result, and accompaniment of all acts of genuine primary intellection. With the metaphysics of time —the validity of this conception as applied to reality, etc.—de-

[1] Lipps: Grundtatsachen d. Seelenlebens, p. 396 f.

scriptive and explanatory psychology does not have to deal. Moreover, in its efforts to trace the genesis and evolution of time-consciousness science finds itself limited at certain points; at last we have to acknowledge that we have reached one of those ultimate facts of all mental life beyond or behind which it is impossible for science to explore. Such facts we call laws of all mental development. Thus we may say that to become conscious of time as the universal form of all psychoses belongs to the very nature of the mind. Indeed, only as an immediate awareness of our states as enduring and as succeeding each other ("*in time*," so we popularly say) is recognized, can we provide for any intellectual development. On the other hand, intellectual activity is necessary for developing this peculiar consciousness. In other words, comparison, analysis, synthesis, judgment, must co-operate and develop together with "time-consciousness" for the completer elaboration of mental life.

Scientific psychology can, however, trace certain conditions under which time-consciousness arises and undergoes the various stages of its development; but in doing this two classes of fallacies and their resulting extremes of opinion must be avoided.

(1) The consciousness of time, in the abstract, cannot be derived merely from single or repeated observations of the fact that the states of consciousness actually do endure and succeed each other "in time." *Enduring and succeeding conscious states, in themselves considered, afford us no full explanation of the consciousness of time-relations as applicable to those states.* Sensations, feelings, "moments" of conation, might come and go forever, without, by the mere fact of their coming and going, accounting for or arousing the consciousness of time. This consciousness is a new and unique reaction of the subject of all the states of consciousness; it implies the active and immediate relating work of mind, according to the laws of its own life. And Sully[1] is quite right when he accuses English psychologists generally of having too naïvely held that the cognition of time is to be explained as "an immediate apprehension of a certain aspect or certain relations of our experience—that is, our enduring and succeeding states." We repeat, the consciousness itself *is* a new form of intellectual reaction. Nor can the conception of abstract time be abstracted from enduring or succeeding states of consciousness as such; it can only be abstracted from the conscious activities which relate these states, as enduring and succeeding, in time.

(2) On the other hand, the consciousness of time does not

[1] The Human Mind, I., p. 339.

spring up in the mind, as a mere form of mental life (an *a priori* empty frame work of experience), independent for its origin and development of the actual experience of concrete states of consciousness and of the conscious comparison of one state with another. *In some sort it is true that every intellect constructs its own time-consciousness.* It is by conscious processes of comparison, under the excitement of feeling, that the temporal framework of experience is itself erected. Moreover, this time-consciousness is capable of development. It begins in the obscure, uncertain, and fitful recognition of relations among the factors and "moments" of experience; it grows with growing intellectual life, as both itself affecting, and affected by, all other intellectual development; it attains only such degree of development, with regard to clearness and accuracy, as belongs to the characteristics of the individual assisted by the means acquired by the race for the measurement and recording of experience, in time. In all this process of development the actually enduring and succeeding states, with those modifications of consciousness which are dependent upon the time of their endurance and the rate of their succession, are material, as it were, furnished for the constructive and relating activity of mind.

§ 14. The development of the consciousness of time is connected, of course, with the development of all the faculties so called. For example, memory, in its complete form as recognitive, implies the ability to place the thing remembered in a particular position in that succession of events which constitutes the stream of consciousness ascribed to self. Thus recognitive memory and developed time-consciousness are interdependent. In doing this we also judge; we lay down propositions as to "*the* time" when the remembered event occurred. Imagination, too, is required in order to frame and apply those ideal standards by which the times and seasons of all the events in our past experience, or in our dreams and anticipations of the future, are arranged and displayed.

Every form of intellectual faculty, however primitive, depends upon the rudimentary consciousness of time. In elucidating the nature of such rudimentary consciousness the following points must be chiefly borne in mind:

(1) The beginnings of time-consciousness imply that all the contents of consciousness, to be related in time, are somewhat prolonged *processes*[1] rather than instantaneous or non-enduring events. All sensations, feelings, conditions—however simple or complex—all psychoses or states of consciousness *are* processes. Psychologically considered, there is no such thing as a "mathematical point of time"—no time that is not enduring time. It "takes time" to come to consciousness, and time that endures less than so much time is an unreality, is no time at all for consciousness.[2]

[1] Compare Nichols: American Journal of Psychology, iii., p. 453 f.; iv., p. 60 f.

[2] Professor James's term. "the specious present"—to designate this actual "time-grasp" of consciousness—seems particularly unfortunate. It is just this "present" which *is* real; the mathematical present, the instant that is gone before it can be seized, is "specious" and unreal.

(2) The consciousness of time, whether of the endurance of a state or of the succession of states, is itself a process. As says Sully, pertinently: "The secondary consciousness is not, strictly speaking, an instantaneous act, but is itself a *process in time*. In other words, the cognition of time is only possible through and by means of a time-experience."

(3) The foundation of a consciousness of time implies the direction of attention to a certain aspect or quality (if the word be not inapt) of a psychosis, or a certain relation of two succeeding psychoses. It is this aspect or quality (?) which we call the endurance, it is this relation which we call the succession—of psychoses, in time.

(4) Differences in the proper qualities and the affective accompaniments of single states, and of succeeding states, actually depend upon the time of their endurance or upon the rate and order of their succession. Pains and pleasures that endure, however alike in other respects, are not the same pains or pleasures with those more fleeting. Perceptions and ideas are marked off from each other in consciousness by the amount of the quality (?) of steadiness which they possess, or by the time-rate of that stream of successive states in which they have their part.

(5) The discernment of that attribute or relation of our psychoses which we call "their being in time," is stimulated and assisted by the affective or emotional character of certain of these psychoses. In adult developed consciousness such an effect of feeling on judgment is very familiar. Interested attention, whether forced or voluntary, with its pleasure-pains, determines the "seeming" endurance and time-rate of our states of consciousness. The more complex feelings of expectation, hopeful or fearful, of tedium and ennui, of mental tension, of longing for change or affectionate lingering over the fading memory-images of past states, etc., are powerful stimulants and guides of our time-consciousness. These are themselves, of course, forms of feeling which depend upon a certain development of time-consciousness. But corresponding rudimentary forms of feeling may properly be assumed to accompany and influence the most rudimentary apprehension of our own states as having the attribute of time. The behavior of children and of the lower animals confirms this assumption. The infant whose present content of consciousness may be described as made up of unpleasant impressions of growing vividness, and fading memory-images of pleasant impressions (as, for example, when its nursing-bottle is rudely pulled from its mouth) is in a condition favorable to the mental seizure of a primitive time-relation. All consciousness of difference in quality is, in fact, an actual process of development, closely akin to the consciousness of succession. The same infant, hungry and waiting to feel the soothing of its well-warmed and well-sweetened draught, is being disciplined not only in patience but also in the perception of time. To *endure* quickens the cognition of *duration* in time. But, chiefly, does the experience with rhythmically recurrent similar sensations, and the agreeable feelings of interest, expectation, and familiarity which accompany the sensations, favor the apprehension of succession in time. To swing a bright ball before the infant's eyes, to croon tunes in its ear, to rock it in a cradle, or sway it in the arms, is to train not only the consciousness of resemblance (as we have already seen) but also the consciousness of time. And when we note "the fragment of the childish hymn

with which he sings and croons himself to sleep," under influence from the instinct of imitation, and with the help of associated ideation, we are witnesses of the beginnings of self-culture in the apprehension of primary relations of time.

(6) In all mental activity directed toward the construction of time-consciousness the entire mechanism of primary intellection is called into play. So far as we are able to say, the consciousness of succession of like states is here most primary. "Again," "again," and "yet again"—the "same," is the voice with which nature gives her first lessons *in time* to her children. And "now"—behold!—the "unlike;" "going" and "yet going" and "now gone"—somewhat thus may we suppose the heading of her second lesson to be. "Wait" and "yet wait;" it is "not yet," but it is "coming," defines what she would next have her pupils apprehend. But while we are able thus far to detect the secrets of her elementary forms of discipline, we must not forget that *the* nature of her pupil is the thing which both she and we have chiefly to take into account. *For the consciousness of time is itself, like every form of consciousness, a process; but its peculiarity is, that it is a unique form of intellectual reaction resulting in the apprehension of all the contents of consciousness as processes, enduring and succeeding each other "in time."* What is the meaning of this phrase, "in time," we shall discover more clearly later on.

We have now completed the survey of those most primary and yet ever present forms of consciousness to which was given the title of "elements of mental life." Strictly speaking, they are all only partial aspects, as it were, of every true and complete psychosis—processes constituent and determinative of every so-called field of consciousness. Detailed as our description has been, it has only faintly represented the intricacy and many-sidedness of psychical activity as it is realized in every one of our mental states. For that which nature brings to pass, at once in all its infinite variety, as a unique totality, science slowly follows after, in its attempt faithfully to represent and to explain. We now turn our attention to the combinations of these elementary processes, in increasing complexity, as the formation of faculty takes place, and the attainment of "mind" (in the full meaning of the word) is secured. That is, we now consider the further development of mental life.

[Besides the references in the notes of this chapter, few can be made to works throwing additional light upon the phenomena of "primary intellection." Of course, parts of all the more vital and truly psychological works on Logic, and the chapters on Judgment and Thought, in all the principal psychological treatises, may be consulted with profit. Especially would we refer to the chapters on "Conception" and "Discrimination and Comparison," in James: The Principles of Psychology, I., xii. and xiii. Consult also, Wundt: Logik, I., pt. i., chap. ii. George: Lehrbuch d. Psychologie, p. 351 f.; p. 499 f. Waitz: Lehrbuch, etc., p. 508 f. Binet: La Psychologie du Raisonnement. Preyer: The Development of the Intellect. Strümpell: Grundriss d. Logik. Spencer: Principles of Psychology, II., chap. viii. Ward: Art. Psychology, Encyc. Brit., p. 75 f. Horwicz: Psychologische Analysen, ii., Buch, i. Lipps: Grundtatsachen d. Seelenlebens, chap. xx.]

Part Third

THE DEVELOPMENT OF MENTAL LIFE

Part Third

THE DEVELOPMENT OF MENTAL LIFE

CHAPTER XV.

PERCEPTION BY THE SENSES

ATTENTION has already frequently been directed to the important truth, that the so-called "faculties of mind"—or forms of psychical activity in which adult experience consists—are developed only in dependence upon the combined effect of all the elementary processes. The different faculties, however, involve these elementary processes in different ways and in different degrees; it is this fact, indeed, which makes it possible to speak of them as *different* faculties. For example, without perception and self-consciousness, memory and imagination are impossible; and yet not more impossible than are the former faculties without the latter. For if I could not remember and imagine, I could perceive nothing, nor could I be conscious of Self. Yet again, intellect, in the form of judgment and reasoning, depends upon all four of the above-mentioned faculties; while they, in their turn, depend for their development upon it.

How, then, it may be asked, shall we distinguish the different faculties, if they all result from combination of the same elementary processes and all involve one another in this complicated way? The answer to this question has already been indicated: the different faculties differ in the forms and amounts of the elementary processes which, in some form and to some extent, enter into them all. Each faculty, so to speak, emphasizes one principal kind of these processes. For example, my perceiving a ten-dollar gold piece in my pocket differs from my imagining one to be there; the difference is not, however, simply because my perception is all sensation and motion without ideation and my imagination devoid of all sensory-motor elements. Again, my being angry at the sight of the man who has insulted me

differs from my perception of his face, from my memory of the insult, and my imagination of its meaning and result; but this difference is not because the emotion, as such, is devoid of coloring from sensory and ideating activity, or because the intellectual acts have no affective accompaniment peculiar to them. But perception differs from memory, and memory and perception differ from emotion, because each emphasizes some of the elementary processes, previously developed, to the relative exclusion or depression of the others. And, in reality, *every complex state of adult consciousness*—that is, every exercise of developed faculty—*is what it is, just because of where it puts the emphasis upon the many elements which enter into it.*

Sense-Perception (as the very term indicates) is a complex form of mental life in which emphasis is laid upon the combined results of processes of sensation. The obvious truth about perception looked upon as psychical activity, is that the senses are actively concerned. We perceive things, their qualities and relations, *through* the eye, the hand, the ear, etc. Perception, looked upon as a product or accomplished result, gives us the *sensuous* qualities and relations of our own bodies and of other things. But should we attempt to account for perception solely as an affair of complex combination of sensation-elements, we should find our attempt unsuccessful. For although sense-perception is chiefly an affair of the senses, a resultant of sensation-complexes that have entered into higher and yet higher forms of fusion and complication, it is by no means simply this. As we shall see more and more clearly in the course of our study of the development of this faculty, all the other primary processes of mind are involved in the full account of it.

And now it will clear up the entire field lying just before us if we consider what data for our explanation of the development of the faculty of sense-perception are already in hand. These may be enumerated as follows: (1) Complex forms of sensation, due to different admixtures of qualitatively and quantitatively like or unlike simple sensations, and varying in a discernible way according to the locality of the organism whose nervous elements are stimulated simultaneously or in close succession ("sensation-complexes" serviceable as "local signs"); (2) Representative images, with varying degrees of intensity and "life-likeness," which, on due excitement being furnished, tend to recur in consciousness, to "fuse" with the sensation-complexes and with one another, and to follow the sensation-complexes and one another, under the laws of association; (3) Feelings, or

affective accompaniments of the combined sensation-complexes and ideas, which depend in part upon the character and succession of the latter and by their variations in "interest," tone of "pleasure-pain," expectation, etc., correspond to the changes that go on in sensuous things; (4) Attention, with its "wandering point of regard," actively or passively directed and focused in the complex field of perceptive consciousness—especially as influenced by the aforesaid feelings of interest, expectation, etc.; (5) Discriminating consciousness (beginning as the "immediate awareness" of resemblance and difference), assimilating, differentiating, analyzing, synthesizing, judging; and so progressively elaborating the content of consciousness (not as something apart from that content—in the full meaning of the word—but as a relating activity in and through the content of consciousness) into higher and higher intellectual forms.

With the preceding five sets of considerations in hand the formation of sense-perceptions (or "presentations of sense," for we shall use these two terms interchangeably) and the development of the knowledge of sensuous things, offers a series of problems, each with its peculiar data as it were, to be solved by the mind. On the other hand, what we call "Mind" is itself developed in and through the actual activity employed in the solution of these problems. It is the purpose of the following two chapters to sketch the principal features of this development. This sketch constantly assumes a reference to the elementary psychical processes already described in detail.

§ 1. The word "perception" has been variously employed, as the history of psychological science shows.[1] The earlier writers made that vague and general use of the term which still prevails in popular language—as when we say: "I perceive your meaning;" or, "I now perceive the truth about the matter," etc. Most recent writers, however, restrict the word to the immediate knowledge of external objects by the senses. This at once introduces the question: How do sensations and perceptions differ? The answer to this question is not only, in some large degree, a test of any author's entire theory of sense-perception; it is also, not infrequently, an indication of the position which he feels himself compelled to assume toward a number of important philosophical inquiries. A view somewhat widely prevalent of late holds that sensations and perceptions differ only in respect of their complexity.[2] But strictly speaking, no statement could be more inadequate and

[1] Compare Hamilton: Metaphysics, Lectures xxi.–xxiv.

[2] Even Wundt, whose whole theory of the nature and development of mental life would seem opposed to the theories ordinarily connected with this statement, is found claiming that *Vorstellungen* differ from *Empfindungen* only in being composites of the latter, regarded as hypothetical simples; and then *Wahrnehmungen* appear as *Vorstellungen* considered as referable to an actual object. But in estimating all this we must remember the meaning which Wundt attaches to his

misleading than this. Such a view results, either in denying the greater part of what really belongs to the perception of things, or else in putting into the sensations a manifold of content and powers which makes them equivalent to the sum-total of all the elementary forms of psychical life. That ideation, as well as sensation, is necessary to perception, has been correctly asserted by various modern writers. Thus Binet[1] defines perception as "the process by which the mind completes an impression of sense by an escort of images." And Taine,[2] in his usual lively and exaggerated way, has declared: "Perception is a true hallucination." (It involves an association of resemblance fusing with one of contiguity.) This need of ideation to supplement sensation, if presentations of sense are to arise in consciousness, is more cautiously and elaborately expressed by Sully in the following definition:[3] "Perception is that process by which the mind, after discriminating and classing a sensation or sensation-complex, supplements it by an accompaniment or escort of revived sensations (representative images), the whole aggregate of actual and revived sensations being integrated or solidified into the form of a percept."

It will be noticed, however, that the definitions just given (and especially the last) imply the discriminating and relating activity of mind as necessary to completed perception. This necessity is particularly emphasized in the following (otherwise uncouth and inadequate) definition of Mr. Spencer:[4] Perception is "a discerning of the relation or relations between states of consciousness, partly presentative and partly representative; which states of consciousness must be themselves known to the extent involved in the knowledge of their relations." Professor James[5] also, who starts his discussion by emphasizing the truth that "perception differs from sensation by the consciousness of farther facts associated with the object of sensation," and by denying that any sharp line can be drawn "between the barer and the richer consciousness," himself constantly emphasizes the judging activity in his account of the formation and development of perceptions. Indeed, when he assumes the existence of an "object" with which farther facts may be "consciously associated," he assumes the entire problem of perception as already solved in its principal and more difficult features. Dr. Ward,[6] however, emphasizes the further processes needed to complete perception by speaking of it as resulting from the intellectual synthesis of proximately elementary presentations; and of this synthesis as determined primarily by the movements of attention, which movements in turn depend very largely upon the pleasure or pain which the presentations occasion.

When, then, we define this faculty as "the consciousness of external objects through the senses," we affirm that *all the elementary processes of conscious mental life are concerned in Perception; but the other processes are to be regarded as excited, directed, and determined, with respect to the completed state of consciousness, chiefly by those peculiar modifications of consciousness which we have hitherto described as sensations.*

words. (See Physiolog. Psychologie (Third ed.), I., p. 269 f., and II., p. 1 f.) The language of the fourth and last edition (I., p. 181 f.), however, implies a view very closely resembling ours.

[1] Psychologie du Raisonnement, p. 10 f.
[2] De l'Intelligence, II., pp. 50 f. and 128 f.
[3] The Human Mind, I., p. 212.
[4] Principles of Psychology, II., p. 268.
[5] The Principles of Psychology, II., p. 76 f.
[6] Art. Psychology, Encyc. Brit., p. 52.

The foregoing conception of the Origin and Development of Presentations of Sense may serve to introduce the statement of the following important general considerations.

(1) Psychology regards the "external object," with all those qualities which constitute its "externality" and those relations which it sustains to other external objects, as the construction of the mind whose object it is; that is, this science describes and explains the *presentations of sense*, like other phenomena of consciousness, "as such." *Things*, regarded as in any way independent of mind—of the receptivity and constructive activity of consciousness—may be of interest to other forms of scientific inquiry. But for psychology things have an interest only as they are (however "externally objective") psychoses. In studying perception, then, we have to do with tracing a certain form of the productive activity of mental life.

(2) It is further apparent, however, that the very words, "external object" (and these words enter into any conception of the perfected process of sense-perception), suggest a contrast to the so-called state of consciousness, as such—to describe and explain which has been said to be the primary problem of psychology. An *external* object is necessarily regarded as "out" of consciousness; so far as it is immediately knowable by the senses, it is also "spread out," more or less extensively, in space. This being "out" and "spread out" is the very essence, so to speak, of the externality of the object. Hence our problem includes the description and explanation of the way in which this "externally objective" character is acquired by certain psychoses. In other words, we ask of science to tell us how things come to be perceived as "out" of us, and "spread out," and related to one another, in space. But here the psychological question must be carefully distinguished from the philosophical problems which it starts, and to which it leads up. Empirical psychology has nothing to do with the metaphysical problems:—Whether space extra-mentally exists, and real things exist related in it, as we perceive them to be; or, What sort of an extra-mental existence, if any, space and things in it can possibly have. In so far as we find belief in the extra-mental reality of space and of things, to be a form of conscious mental life, it is, of course, the business of psychology to make a note of this, as of any other phenomenon of consciousness.

(3) Our problem is not, then, to show how external objects get set by the mind in an already really existing and empty space. For psychology "empty space" is itself only an abstraction, dependent (as every mental abstraction is) on a developed

activity of memory, imagination, and judgment, in connection with presentations of sense already acquired. In other words, we neither make empty space, nor assume such space, and then put into it our presentations of sense. On the contrary, as has just been said, we derive our conception of empty space from presentations of sense. Still further reflection shows us that these same presentations of sense exist for us as a basis for the process of conception, only as they already have the characteristics of being "out" of consciousness, and "spread out"—in space. And so the problem recurs: How does this immediate awareness of the objects of sense as external and extended, come about? For to adult and developed consciousness, all presentations of sense have the characteristics of externality and extension. Indeed, sense-perceptions differ from mere sensation-complexes (if we neglect for the moment the objective reference of the latter) chiefly in respect of these important characteristics.

(4) Strictly speaking, however, what we are seeking has to be, at some point in the course of our descriptive and explanatory science, assumed as already existing. What is sought and assumed is the externality and extensity of the object presented through the senses. Now, at some point every investigator is obliged to confess that his data of explanation begin to fail him. This is necessarily true of all theories of sense-perception. They all have to make an appeal, in order to find an explanation of certain primary facts and results, to the assumed but unexplained nature of the Mind itself.

(5) It follows from the foregoing considerations, that the constituting of presentations of sense, into extended and external objects, is the result of a mental development. It is a progressive achievement of mind, a resultant of a growth in knowledge. This achievement and growth are made possible by the combined action, in higher and more complex forms, of all the elementary psychical processes. But just as every living being has, in its so-called "nature," certain laws to observe, or certain general forms of development to which it must conform, so it is with the Mind. In the discovery and statement of these laws and powers we reach again the limits set to scientific analysis and to the explanations it affords.

(6) Roughly speaking, two principal stages in the construction of presentations of sense may be recognized. These are not, however, distinctly separable either in time or in the character of the effect upon consciousness from the maturity of experience which they indicate. They are sometimes called "local-

ization" and "eccentric projection." The former emphasizes the necessity for a system of cognitions relating to the different areas, both internal and superficial, of the body, in order that all things other than the bodily members may be known through the spatial relations they sustain to it. The latter emphasizes the cognition of these things as altogether external to ourselves (including "in ourselves" the entire bodily organism), and as having spatial qualities and spatial relations to one another. But neither of these complex processes can be carried forward without involving the other; neither can be carried far without bringing forward, in a corresponding manner, the other. The child gets acquainted with its own body and with things external to it, *pari passu*, as it were. Or rather, even our primary problems of perception are complex and have reference to these two ends: to know our own body, so as to know all other things as related to our own body. At first, and previous to a considerable development of perceptive experience, the child neither knows things nor its own body as separable objects. All the way along the path of its early development, it is learning to know things, as separable from its own body, through their changing relations to, and effects upon, the body; and it is also learning to know the different parts of its own body, as separable from each other and from things, by the same general class of means.

(7) In all this complicated history of the development of perception, certain of the senses play altogether a different part from that which can be assigned to the others. It is experience gained through the eyes, and through the skin, muscles, and joints—with their constantly combined activities and consequent fusion of resulting sensation-complexes — which constitutes the spatial qualities and relations of sensible objects. Through sight and touch (in the extended meaning of the latter word) alone does the consciousness of extended and external objects originally come. The other senses give us only secondary and inferential knowledge of the qualities of things as they have already been constructed, with their spatial qualities and relations, by visual and tactual perception. In other words, presentations of sense are regarded as smellable, tastable, audible, only as we attribute the exciting cause of these modifications of consciousness to external objects already known as existing in space constructed by sight and touch. It follows, therefore, that the description of the formation and development of a so-called "field of touch" and a "field of sight," covers the principal part of the psychological science of perception.

(8) And, finally, when we raise the inquiry as to why sight and touch, not only lead the other senses, but really cover nearly the whole field of investigation here, we can give only a partial answer. The reason appears, however, to be connected with the character of the sensation-complexes, which can be excited only by the activity of these senses. Only the organs of the eye and of the skin (including muscles and joints) are capable of giving rise to so-called "spatial series" of sensation-complexes. The chief characteristics of these *eminently* spatial series of sensation-complexes are the following three: (*a*) They possess a system of "local signs" as the non-spatial series do not. How true this is, and in what manner true, of sight and touch—the so-called "geometrical senses"—has already been sufficiently explained (see chap. viii). (*b*) Spatial series, or such as are adapted to combine into external and extended objects of sense, must admit of easy, frequent, and rapid repetition, in varying order of arrangement. These characteristics, too, belong chiefly to sensation-complexes of the eye and skin—including the muscles and joints. (*c*) Two spatial series of sensation-complexes when experienced simultaneously or in close succession (that is, when entering into the same field of consciousness—in the broadest meaning of this term), must be comparable and associable with each other. Only thus can that unity which belongs to objects of sense, as resulting from the intellectual activities already described, be secured. Here, again, the two geometrical senses are incomparably superior to the other senses.

It may be declared, then, in a preliminary way, that the following is a brief history of the formation of every presentation of sense: Two or more series of sensation-complexes, having the characteristics of spatial series, and belonging to the same or to different organs of sense, occur simultaneously or in immediate succession; they are frequently repeated in close conjunction in consciousness, and are associated with conative impulses that result in movements of accommodation; representative images and traces of conative impulse, due to this frequent repetition, become fused with, and are suggested by, similar sensation-complexes in every new experience; feelings of interest, expectation, etc., become the habitual affective accompaniments of this complicated "mass" of sensation- and ideation-elements; and discriminating and relating consciousness is ever active (comparing, assimilating, differentiating) to accomplish the higher unifying process which is also necessary to the cognition of all objects of sense.

In the development of perception two things are especially to

be noticed: First, the relative amount of sensation-complexes that have a genuine peripheral origin, becomes smaller; the relative amount due to manifold revived ideas, and to subtle and rapid judgments habitually performed, becomes greater.[1] Physiologically expressed: Perception becomes more and more *brainy*, rather than external-organic. Psychologically expressed: Perception becomes more and more a matter of *ideation* and of quick *inference*, rather than the mere having of sensation-complexes. But, second, the development of interest in discrimination, and of power to discriminate in a more varied and accurate way, results in enlarging the content of the sensation-complexes (the observed traits of the object of perception) that enter into the presentations of sense. *Increase in the wealth of sensuous details, and higher ideal and intellectual quality, both belong to the possibilities of developed sense-perception.*

§ 2. It has been customary to speak of one class of theorists, in the matter of sense-perception, as Nativists and of another class as Empiricists. By a "nativist" we understand one who assumes the cognition of the spatial attributes and relations of objects of sense as a "native" (unacquired) power of the mind; and who, therefore, denies the possibility of acquiring by experience the so-called "intuition of space." By "empiricists," on the other hand, we understand those who hold that this peculiar form of cognition is acquired; and who are piqued by the admission that we have to limit our scientific explanations anywhere by an appeal to the so-called native (unacquired) power of the mind. Among extreme nativists we might properly class the entire Scottish school, who, on the basis of the testimony of crude, unanalyzed, adult consciousness, teach that all kinds of sensations (those of smell, taste, and hearing included) are from the first intuited as external and extended objects of sense. (In the case of some of these writers, *the* object thus immediately intuited is said to be the "excited sensorium;" as though an immediate knowledge of the organism of sense, itself out and spread-out of consciousness, belonged to the most primitive activities of all the senses—a position than which nothing could well be more difficult of proof.) A modern and modified form of nativism has been advocated with great skill and learning by Stumpf in Germany, Dr. Ward in England, and Professor James in this country. These writers agree in attributing "extensive magnitude," "voluminousness," or "bigness," from the very first to some or to all of the sensations. On the other hand (not to speak of the less modern views of the Mills, etc.), extreme empiricists, like Bain and Spencer, regard the space-intuition, so-called, as derived wholly, or chiefly, from successive experiences of muscular movement. Every theory of the formation and development of presentations of sense is obliged to define itself with reference to these two classes of extremists.

In truth the advocates of neither of these extreme views succeed in overthrowing the fundamental positions of the other side, so far as the positions

[1] On this subject, see Herbart, Psychologie als Wissenschaft, II., p 368 f.

are constructive and positive. The nativist cannot well deny the evidence which observation and experiment, accompanied by analysis, bring to bear upon the history of the development of sense-perception. These must certainly be trusted as to the *facts*, so far as we can get at them; and the appeal from science to the testimony of "common-sense," of crude, unanalyzed, adult consciousness, for the decision of questions which concern the very nature of the development of the aforesaid consciousness, is quite unwarrantable. This—as it appears to us—is what not only the old-fashioned Scottish common-sense realism, but the nativism of writers like Dr. Ward and Professor James is constantly doing. On the other hand, the empiricist cannot well deny that whenever, and however, successive experiences of sensation-complexes (regarded as subjective occurrences in the time-flow of consciousness) are apprehended as external and extended objects, some wholly *new* aspect, or set of attributes, is at once assumed as belonging to the aforesaid sensation-complexes. In other words, *mere combinations of unextended and internal sensations, regarded as such, can never explain the arising in consciousness of objects cognized as extended and external.* Thus it may be said that writers like Bain and Spencer are constantly smuggling in the very thing which they set themselves the task of explaining.

So far, then, as the construction of a theory of perception by the senses is concerned, the claims of both nativists and empiricists, as made against each other, must largely be admitted to be true. In brief, we must hold with the latter against the former, that to limit the explanations of psychology with respect to the stages by which, the time at which, and the senses by which the construction of space-intuitions takes place, and resort to so-called "common-sense," or "every man's consciousness," is to abandon the attempt at science. But we must also hold with the nativists against the empiricists that all description and explanation with reference to times and stages and methods of acquiring space-intuitions cannot dispense with the assumption of a peculiar and unique activity of mind. So far, however, as facts are concerned, both extreme nativists and extreme empiricists are often plainly in the wrong. One party is apt to be warped in one way, the other in the opposite way, by the exigencies of theory. Thus when Dr. Ward, in the name of common-sense, or of adult consciousness, attributes "extensity" to the most primitive sensation-complexes of other senses than sight and touch, he is raising a question of fact. The claim of extensity for primitive sensations of smell and taste, as such, seems to be disproved both by experimental science and by the language of ordinary experience. But when Bain and Spencer claim that all consciousness of objects as having externality and extensity, by sight, is indirect only and meaningless except as translated into terms of successive tactual and muscular sensations, they, in their turn, come face to face with certain facts that contravene their theory. When, again, Professor James[1] holds that movement is not necessary to space-consciousness, but only renders it more distinct, regarded as already acquired, he, too, is raising a question of fact; and on this question of fact the experimental evidence seems to be adverse to his view.

But, once more, certain questions of fact in dispute between the nativists and the empiricists—and among them the most fundamental and necessary to

[1] The Principles of Psychology, II., p. 178 f.

a thoroughly satisfactory theory—are—alas! probably incapable of being answered with much confidence. For example: How do things look and feel to a baby before it really has the power to perceive any visual or tactual thing? Or—perhaps better: How shall *we* conceive of the beginnings of that experience, in terms of which, only after it is highly developed, we are obliged to construct all our conceptions? For their dealing with such questions as these Sully [1] appears to be quite justified in accusing Dr. Ward and Professor James of assuming "a psychological impossibility, viz., a consciousness of abstract space or room without any rudimentary discrimination of particular parts or regions, directions or distances" ("general extensity," or "bigness," that is no particular extensity or bigness—like a "buzzing sound in the ear" that is really not a "buzzing" and not known as "in the ear").

Among the problems of fact that are in debate between the nativist and the empiricist, but are capable of only a doubtful answer, we note the following three: (1) Do sensation-complexes which include no motor elements—either in the form of so-called sensations of motion, or of sensations of position resulting from previously excited sensations of motion—ever possess primarily the attribute of extensity? This inquiry we incline to answer negatively, for reasons already given in part, and for others soon to be brought forward. At any rate, on this point the affirmative position of the nativist can adduce no clearly proven facts. (2) Have the most primitive sensations of light and color the attribute of extensity, or do they acquire this attribute through experience in the use of an exploring point of regard with a moving eye? To this question of fact, also, only a doubtful answer can be given. It is true that motion is actually furnished as an accompaniment from the first, of the excitement of the local signs of the retina; and we shall find that a moving point of regard is exceedingly influential in delimiting by the eye all spatial qualities and relations for adult consciousness. On the whole, then, we are inclined to affirm that discriminating consciousness and practice with a moving eye are necessary in order that light- and color-sensations may acquire extensity.[2] (3) Is the perception of the extension and contours of motionless objects by the skin dependent upon revived and associated images of past sensations, originally partly muscular and occasioned by active touch with moving organs? The reply to this question falls partly under the reply to the first question. Passively and actively induced sensations of muscles and skin—and even these only after repetition, association and discrimination—*acquire* extensity in the process of the development of mental life.

In fine, we agree with Sully [3] in holding that "whatever the precise nature of this primitive 'massiveness'" (attributed unwarrantably by the extreme nativists to the most primitive sensation-complexes of every sense) "it seems reasonable to conclude that it requires the incorporation of motor ideas before it becomes *spatial* as we understand the term."

Perceptions of Smell and Taste, *as such*, have no extensity or externality whatever. They differ only in quality, intensity, dura-

[1] The Human Mind, I., p. 227.

[2] Readers of the author's Elements of Physiological Psychology will notice that this position is less nativistic than that taken there, p. 426 f.

[3] Ibid., I., p. 227.

tion, and accompanying tone of feeling; they are localized only indirectly on account of their connection with tactual and muscular sensation-complexes; and they are attributed as qualities to objects only by a system of secondary and doubtful inferences. The series of sensations which originate on repeated stimulation of the organs of smell and taste—that is, the purely olfactory and gustatory sensations as distinguished from the accompanying sensations of other kinds with which they fuse—are "non-spatial." They are lacking in a system of local signs; they do not admit of easy, rapid, and frequent repetition in a graded order; they are not comparable and associable with each other or with spatial series of other senses. Hence they are unfit for use in acquiring an immediate awareness of extended and external objects. They have also in general a peculiarly flickering and vibratory tone. Their principal office in the development of the mental life is due to their reproductive energy —this being especially true of perceptions of smell. In many of the lower animals they possess a great biological value on account of their connection with the preservation of the life of the individual and the propagation of the species. But in the case of civilized man their value is chiefly semi-æsthetical. Hence the knowledge gained by these perceptions is, in a measure, of the nature of a superfluity. But when cultivated by discriminating attention upon a basis of a rich organic and sensuous development, much curious information regarding the properties of things may be indirectly gained by perceptions of smell and taste.

§ 3. Perception by the nose as the organ of smell is indirect, olfactory sensations being localized there and acquiring their organic voluminousness through the accompanying muscular and tactual sensations. This is easily accomplished as an intellectual act, since we sniff in the air through the nostrils and note its effect in producing both non-spatial olfactory, and spatial muscular and tactual sensations. Two qualitatively and quantitatively discernible olfactory sensation-complexes do not appear capable of being placed "side by side," as it were, in the field of consciousness. In case of the simultaneous influence of two smells (as Valentin showed), the stronger overwhelms the weaker. Perceptions of smell have then to be compared "in time" and not "in space," as successive and not as contiguous. Such perceptions give us no immediate awareness of the qualities of objects as external and extended. The direction and character of smellable objects is judged or inferred, in a secondary way, by the intensity and quality of the sensations, as we turn the head, approach to or recede from the object, etc.

How different objects smell (the perception of objects by smell) is a kind of knowledge which admits of a high degree of cultivation on the basis of a

great variety of natural gifts, so called. Here the degree of discrimination and the æsthetical value of the sensations vary often in inverse ratio. The lower animals and lower races of men obtain information through the nose, of which most civilized men are incapable. Thus Haller states that the negroes of the Antilles can distinguish by smell the footsteps of a negro from those of a Frenchman; and Humboldt affirms that the Peruvian Indians distinguish in the same way the race to which an approaching stranger belongs. We have already (p. 136) called attention to the special acuteness of olfactory perceptions—amounting sometimes to an astonishing idiosyncrasy—possessed by some hypnotic subjects, or by individuals who have had a highly specialized development in this direction. It is said that the mysterious Caspar Hauser could perceive the leaves of different fruit-trees by smell; and persons blind and deaf-mute have been known to acquire remarkable faculty in discrimination along the line of this sense.

§ 4. Perceptions of taste, if we disregard the ceaselessly accompanying perceptions of passive and active touch, with a tongue that moves and over which the tastable substance is moved, are of an order similar to those of smell. If we lay two tastable substances, a sour mass and a bitter mass, on two different areas of the tongue, as objects of tactile perception, they may be discriminated in space as two. But as tastable, the two will either have to neutralize each other, or become compared in time as one taste predominates over the other. Tastes, like smells, cannot be made to lie side by side in the field of consciousness. On account of the constant accompaniment of tactual and muscular sensations, tastable substances are necessarily perceived as "in the mouth;" we do not need to explore surrounding space to find out where or what they are. But the character of that intellectual activity by which, on a basis of repeated experiences, we perceive the qualities of things by taste, is in principle the same as that which applies to the more subtile and evanescent sense of smell. No immediate awareness of an extended and external object comes through the gustatory sensations alone; their series is "non-spatial."

The development of perceptions of taste differs, however, from that of smell, in some important particulars. The æsthetical value which tastes have, in the culture of the individual and of the race, is far more universally influential. Among highly civilized people relatively few get any training in nice perception of delicate perfumes; and even odorous flowers are customarily prized more for their looks than for their smell. But the great body of civilized men become "particular" with respect to the discriminated character of their gustatory sensations; and *how* things edible and drinkable taste is for every individual an important practical question. As good dining becomes more closely connected with sanitary considerations, as well as with the pleasure-pains of gustatory sensations, a large general development and an astonishing special acuteness of perception are the important results. And if our modern epicures cannot equal the Roman epicures, who professed to know, by taste, where the fish was caught and on which leg a partridge had slept; our tea-tasters and wine-merchants, etc., as well as the multitude of the people, are perhaps becoming sufficiently "intellectual," as well as æsthetical, on the side of development ministered to by this sense.[1]

[1] On the entire subject, see Brillat-Savarin: Physiologie du Gout, translated into German by Carl Vogt, and into English by Anderson.

Perceptions of Hearing are, in some respects, confessedly more difficult to deal with in terms of a theory which denies original extensity or voluminousness to auditory sensations. There is, however, sufficient ground for maintaining that objects are perceived as external and extended, by the ear, only through a complicated system of indirect references. These references are dependent upon associated spatial series of a tactual and muscular sort. In other words, objects perceived as sonorous have, in so far as they are sonorous simply, no spatial qualities or relations. But sensations of sound are localized in the bodily organ as more or less "acute" or "massive," or else they are projected into space as more or less distant; and they are attributed to extended and external objects as belonging to them—in complete dependence on the space-constituting activity of eye, skin, and muscles. We acquire the perception of sounds, as "in the ear," only after we have arrived at the perception of this bodily member in terms of touch. Even then we localize sounds, as in the ear, or as external to our bodies, by means of their tactual accompaniments, or by our acquired knowledge of the intensity and quality appropriate to so-called "entotic" or to external sounds. The voluminousness which sounds have, considered as apart from variations in complex quality and intensity, depends upon associated tactual and muscular sensations with their affective accompaniments. While it is true that in adult experience we orient ourselves in space and perceive the direction of sounds with great speed and considerable precision, yet this, too, is as an acquired art differing in different persons and dependent upon attention to, and previous experience of, the tactual and muscular accompaniments. The complete set of data in the form of sensation-complexes, upon the basis of which this acquired art of interpretation takes place, is not, however, as yet experimentally determined.

§ 5. In answer to the question, How do we localize sounds with respect to our own bodily organism? the character of so-called "entotic sounds" has an important bearing. Such sounds are caused by some form of stimulus arising in the neighborhood of the organ, within the body (the vibration of adjoining muscles, the whirring of blood in the blood-vessels, the singing in the ears due to cerebral excitement, etc.); but whether we localize them in the ear, or external to the body, depends upon difficult and complicated judgments. Few persons, of the many troubled in this way, have not been puzzled to know whether their morning dose of quinine or a cricket in the window was accountable for a tormenting and persistent buzzing in the ears. In certain pathological cases the power to distinguish between entotic and external sounds is wholly lost. On the other hand, persons

who have good powers of abstraction and a high æsthetical interest in musical sounds can, so to speak, call them, as sounds, almost or quite entirely from "without" (in any sense of the word) into the very purest life of the soul. Then one is for the moment wholly unconscious of the objective aspect of these sensations; one's life becomes subjective, a succession of states in time, each of which is characterized by a sort of being *in* the sweet sounds. Experience is then better described, not by saying, I hear such and such sounds with or in the ear; but I live, in time, in the succession of sounds. There is here no awareness, either immediate or indirect, of the qualities of acoustic objects; but a self-being, determined in time, as a succession of sensation-states. Hence it is customary to speak of music as the most "interior" of all the arts. But to look at the musicians, or to converse with a friend about the music, involves a totally different and a truly objective process of perception.

Again, the terms "acute" (or "piercing," and the like) and "massive" or "voluminous" (like the notes of the base *clef*), refer to tactual and muscular accompaniments of auditory sensation-complexes. This becomes perfectly plain when we select extreme instances. When, for example, I stand near a door which is violently slammed, or a cannon which is fired, the most impressive part of the total experience is that the side of my head seems to be struck a blow, or that my entire body (and especially the internal organs) is set vibrating. It is obvious that the very words acute and piercing are taken from our experience with touch. In this connection it should be remembered that the ear, as an organ of touch, unlike the eye, has no means of protecting itself against the assaults made upon it, by the stimulus. It cannot escape by motion or cover itself up; it must stand and take what comes. Thus it is not only excited as the end-organ of auditory sensations, but also more or less shaken as an end-organ of other sensations.

As to the data for localization of sounds, as respects direction and distance in surrounding space, two things appear indisputable. The "surrounding space" is not a construction, either immediate or indirect, of the ear. Furthermore, our inferences as to distance and direction of sounds are particularly liable to mistake. This latter fact is due to the complication of data by use of which such speedy and seemingly immediate consciousness is gained. For example, Münsterberg,[1] experimenting with three clicks of a stem-winding watch, found (1) that the maximum of accuracy in the horizontal circle was in front, where a change of less than 1° was frequently recognized; but the accuracy declined continuously to just behind, where nearly 6° variation might be unrecognized. (2) In the frontal vertical circle accuracy was greatest directly opposite each ear, and directly above and below the central points of the head. (3) In the median circle the maximum accuracy was 45° below the horizon. His general conclusion was that our perception is influenced by the character of the disturbances in the semi-

[1] Raumsinn des Ohres, Beiträge, etc., Heft 2, 1889. Dr. Gellé (L'Encéphale, 1887, No. 1) tells of a subject of Charcot, afflicted with general anæsthesia of the skin, extending to the external meatus and the tympani of both ears, so as to be absolutely insensitive to contact and pain, who could *hear* perfectly well the tick of a watch, but with closed eyes *could not tell on which side of the ear it was*. Hence, he argues, that the sensibility of the skin, as stimulated by the vibrating current, gives the sense not only of direction, but of exteriority, to sound. This patient could not locate *even in which ear*. Other similar cases have existed.

circular canals, as reflexly connected with the memory-images of the movements necessary to bring the point whence the sound comes into the median plane of the head where hearing is most distinct. Another experimenter (Preyer) found that right and left were rarely confused, and location in the median plane quite accurately determined. The greatest errors, amounting sometimes to 180°, occurred in the front and back positions. He was led to conclude that the means of locating sounds are chiefly to be found in the relative intensities of the stimulations given to the nerves of the different ampullæ and semicircular canals.

It is a general principle that sound is located upon the side on which it is most intensely heard; and if both sides are equally intense, then in the median plane. K. L. Schäfer[1] found that with beats of equal intensity in both ears the sound may even be located *in the middle of the head*. When using both ears, and at the same time moving the head freely in space, the direction of sound appears to be determined by differences in the intensity of the sensations as dependent upon changes in the relative positions of the ears. Rayleigh found that the perception of the direction of a word was more accurate than that of a musical sound; this is probably due to the greater amount of discriminable change that can be produced in the sensation-complexes. It is sometimes found that on conducting an intermittent current from a telephone through both ears the perception of tone may be localized in the median plane of the head.

On the whole, then, experiment with localization of the direction of sounds in surrounding space, while there is still something obscure about the complete data for such localization, tends to show the determining effect of tactual and muscular rather than auditory sensations. *It is by tactual and muscular exercises, and practice gained by such exercises, that our auditory sensation-complexes are localized in a space already constructed by activity of eye, muscles, and skin.*

"Space-intuitions" of Touch (including in this word the activity of skin, muscles, and joints) result from the progressive solution of two closely connected classes of problems. The first of these concerns the perception of one's own body—of the "locality" to which any particular series of sensuous modifications of consciousness shall be referred In adult life we find ourselves immediately aware of the places, in a general system of localized sense-experiences, to which our tactual sensations are to be assigned. Grown-up people do not have unlocalized sensations of pressure, of temperature, and of the muscular or joint order. They rather perceive some definite extent of the skin to be pressed upon; or, that it is the back, arms, or legs, which are cold or warm; or, that this or the other particular limb is moving so far in a definite direction, or has reached such a position of rest, and no other. We can tell quite promptly and positively just where we are pricked, pinched, cut, burned, etc. Further-

[1] Zeitschrift f. Psychologie u. Physiologie d. Sinnesorgane, i., Heft 2, 1890.

more, we can more or less definitely localize and perceive the character of the changes that go on in some of the internal cavities of our body. Everything, however, which we know about the beginnings and development of sense-experience convinces us that this immediate awareness of locality did not always exist. Indeed we have already adopted the view that not only is the entire field of touch the result of a constructive development, but also that without discriminating consciousness attendant upon those local signs which vary with active and passive movement, the sensation-complexes of the skin would acquire no extensity. It is necessary, then, to show briefly how, on the basis of data and activities already described, the "localization" (in the widest meaning of this word) of our bodily surfaces and members is developed by this sense.

But another class of perceptions by the skin, muscles, and joints demands an account of their development at the hands of the student of psychology. These perceptions constitute much of our complex knowledge of the qualities and spatial relations of other bodies than our own, of things outside of us. Bodies that can be laid, or pressed, against our skin become known as extended, with a rather vague delimitation, to touch. But if we can trace out their outlines with a slowly moving finger or hand, and with careful attention, the delimitation becomes much more clear and accurate. By pulling at or pushing against things we perceive them as external, as solid, heavy, and as fixed or movable. Again, it is by touch and its accompaniment of varying muscular and joint sensations that we determine the texture and constitution of other bodies — whether they are soft or hard, smooth or rough, fluid or viscous, or firm at the surface, warm or cold, moist or dry, etc.

Now, neither with respect to their habitual activity, nor with respect to the resulting perceptions of tangible qualities and relations, can these two classes of touch-experience be considered as independent. By the active exercise of any member of our own body, as an organ of touch, upon some other part of the same body (notably of the hand upon any of the surfaces within its reach), we gain the perception of the different areas of this body, as rough or smooth, moist or dry, hard or soft, and as external to each other, and, in some sort, to the stream of our conscious life. By touch the body thus becomes a system of things, external and extended, to itself: one part is given to another, as "out" and "spread-out," in the same manner as that in which other bodies than our own are perceived. On the other hand, really external things that are closely connected with the sur-

faces of the skin (like our hair or our clothing), or with the movements of muscles and joints (like our fork or walking-stick), may themselves serve to expand the limits of our own bodies, on whose surface the different pressures, and in whose members the different movements and positions, are "localized." Thus things become perceived as parts of our own body; and instead of appearing as out and spread-out to us, they serve as organs by which we perceive the being out and spread-out of other things.

It will be convenient, however, for purposes of analysis and description, to consider each of these two interdependent classes of perceptions somewhat separately. The "unnaturalness" of this treatment is like that which accompanies all scientific attempts to explain in detail the manifold cotemporaneous forms of the procedure of mind. One other truth which follows from the preceding should also not be forgotten. The development of perception by touch proceeds, like all other mental development, from the relatively simple, and yet vague and obscure, to the relatively complex, definite, and clear. *Perception*, as distinguished from any of the elementary processes which it involves, results whenever, by combination of two or more spatial series of sensation-complexes, with their accompaniment of associated images, feelings, and conative reactions, objects extended and external are presented—however simply, vaguely, and obscurely—in consciousness. By practice with such combinations and their ideational, affective, and conative accompaniments, the definite and clear construction of complex objects is developed. Some of the more important points won in this process of "localization" by touch will now be briefly discussed.

§ 6. The earliest knowledge of our own bodies by touch is probably a vague perception ("vague," that is, because its delimitation is not fixed but fluctuating, and not marked out in details by analytic attention but "in the mass," as it were) of those members that *move* most frequently, in the most varied manner, and with the most marked tone of accompanying feeling. As rivals of these for early recognition are those portions of the body most frequently pressed upon or moved over, with a marked tone of accompanying feeling. Such members of the body as have both these advantages would surely emerge first "in the struggle for existence," as perceived parts of the body. Thus, crude perceptions of the arms and legs, of the abdomen and back and face (especially about the mouth) probably constitute the total touch- and muscle-percept of its own body, for the child. The nearest representation of this, which is possible for our developed consciousness of body, may be obtained as follows: Let one close one's eyes and abstract attention from all knowledge of one's body in terms of sight. And now let one inquire, What is my body as a whole, and what are its different members, to me, in terms of skin, muscle, and joints? The answer which

our "immediate awareness" gives to the first part of this question is surprisingly meagre. Except as I am able to visualize my body, it is largely gone out of consciousness, as a totality of members. I can, however, by directing attention to its better known areas *perceive* them as extended and solid. Thus "perceived," the right leg, for example, is a somewhat massive system of sensation-complexes of pressure localized where this member comes in contact with the chair, and with the other leg (over which it is lying), combined with less vivid sensations of tactual, joint, and muscular kind much less perfectly localized, together with dimly revived ideas of similar sensations, vague feelings of uneasiness or pleasurable excitement, and a conscious tendency to innervate the muscles, and perhaps to move the organ, as attention is directed thereto. Excluding sight and all reference to visual things in surrounding space, and even to other members of the body, this is all that the leg is consciously perceived by me to be. Suppose, however, it is required to verify, clear up, and complete my perception of this bodily member. Let it then be *moved*, with attention directed to what takes place. Still better, let it be not only moved, but also pressed or struck against some resisting object. At once my perception of it changes in the direction desired. *It now lives as a perceived object in every part of its length; it exists for me as my limb, which I am conscious of in a way quite impossible before motion begun.*

This same process of obtaining a perception of their tangible extension and "reality" may now be applied to other bodily members—to arm, to back, to abdomen, etc. To secure vividness, and the utmost possible completeness for parts like the last-mentioned two, it will be necessary to press against some object (the back against the chair), or to induce some movement of, or over, the bodily mass (as when one perceives the abdomen by attending to it when breathing, or when it is pressed by a moving hand). But after one has thus exhausted one's "immediate awareness," in terms of touch, of the bodily members separately, the perception of the entire body in these same terms requires a rapid transition of attention from one member to another, with a large amount of ideation and vague conative accompaniment. In attempting this it is almost impossible not to resort to translation into terms of sight. How strange the picture of "the body" which would result should an artist present to the eye the exact equivalent of the most perfect intuitions of only skin, muscle, and joints!

§ 7. The explanation of the earlier acquirement of this class of perceptions is now not difficult, so far as explanation is possible at all. The first movements of the infant's bodily members have already been shown to be reflex and automatic-nervous; they involve neither perception of themselves nor of an end to be reached by the movement. They are not *by* consciousness, but *for* consciousness. On every occurrence of movement in any member, however, two or more spatial series of sensation-complexes are necessarily run through. These being woven in and out, as it were, furnish data of sense for perceptive consciousness in its progressive achievement of localization. Thus the arm cannot be moved, either reflexly or automatically, without producing changes in the sensation-complexes of skin, muscle, and joint. As this member (A) moves from X to Y, the three spatial series (s = skin; m = muscle; j = joint) simultaneously run through

changes of sensation-complexes that may be indicated by (s, s^1, s^2, s^3, etc.), (m, m^1, m^2, m^3, etc.), and (j, j^1, j^2, j^3, etc.). By repetition, with its necessary accompaniment of association of the ideas constituting a series, by condensation of series, with affective accompaniment in the form of expectation, surprise, etc.—primary intellection being always present—every position occupied in this arc through which the arm is moving becomes marked off, or characterized. Thus we have one position = A ($s^3 + m^3 + j^3$), fused with primary images (of s^1 and $s + m^1$ and $m + j^1$ and j) fading out of consciousness, and reviving images, with stirring feeling of expectation corresponding to ($s^3 + m^3 + j^3$, etc.). What is true of this arc from X to Y is true of every other arc through which the same limb moves. This "mass" of sensation-complexes, fused with ideation-products, and accompanied by appropriate affective and conative elements, *is* the arm of the infant (with some elements changing and some remaining similar for every position and movement) as defined in terms of touch. And as with the arm so with all the other movable members. By practice in discrimination, and not always gradually, but with sudden leaps that are stimulated by some important practical end or sharp excitement of feeling, the different movable members of the body assume their place in a system. It has already been shown that this system of tactile experiences is comparatively vague and broken for adult consciousness. How much more so for the dawning intelligence of the infant!

§ 8. But—as we have already seen—the perception of the positions of the movable members of the body develops in dependence upon our experience with them as in motion. Two important differences in these two kinds of perception should, however, be noticed here. (1) When any limb is at rest it must be either *held* in position by the muscles, or *supported* in position by something else—either by some external thing or by some other portion of the body. In either of these three cases abundant data are furnished for perceptive discrimination. In the first case, such data consist chiefly in the increased intensity and changed quality of the joint and muscular sensations, together with that feeling of being drawn upon for energy, and strained, which is, probably, partly of intra-cerebral origin. In the second case, the more passive sensations of pressure take a comparatively prominent part; and the position of the limb is discriminated rather through the localization of these sensations. The third case differs from the second in that here another mass of sensation-complexes of the skin (due to pressure upon some area of our own body by our own limb) may aid in the discrimination of the limb's position. *Thus the sensation-elements for the "perception of position" are marked off from those of motion.*

But further, (2) in our perception of the position of the movable members of the body we ordinarily make a much more extended demand upon memory. That is to say, it is the ideas suggested by the actual sensations now experienced which more largely determine our perception. This statement, too, is capable of making an appeal to adult consciousness. Indeed, in all cases of attempted localization of a limb at rest, it is difficult to resist the tendency at once to draw an ideal visual picture of the limb, as suggested by the present meagre data of sensations. If we try to perceive the position of one of our own limbs while at rest, in pure terms of touch, we find

ourselves imagining how it would "feel" to trace out the limb with the hand, or to move it from its present position to another in surrounding space. That is to say: *our immediate awareness of the position of our movable members is largely a system of associated ideas due to previous movements.*

§ 9. The finer discriminations of locality upon the surface of the skin are the subsequent achievement of discriminating consciousness operating with data already recognized and described. For the upper and lower arm, for the hand, and for each of the fingers and phalanges of each finger, considered as movable members of the body, the same general principles apply. But the most highly developed form of localization by touch results in the possible discrimination, by what appears to be an "immediate awareness," of minute areas of the skin—their extent and relative place in the superficial system of pressure-sensations. This development, just because it is "high," is a late and supreme achievement of tactile consciousness. If it is true that the infant cannot for some time locate his pain in his toe (or, to use Professor James's expression, "place his toe in the pain"), *a fortiori* is it true that he cannot tell precisely where, in his toe or other member, he is pricked with a pin or pressed with the nurse's finger. Nor is this inability due to the fact that he has not as yet developed so detailed a geography of his own superficial areas. The rather is this lack itself due to the necessity that the infant should learn to make, and actually make, repeatedly, the finer qualitative distinctions. When, then, we are pointed to the promptness and accuracy with which adults can tell what part of the skin is hit, pricked, or pressed, etc., as a proof of native power to perceive "extensity" and spatial relation, the index is not directed toward the required mark. The very thing to ask is, how this prompt localization has come about. The earlier perception of the areas of skin as under pressure is in "gross mass" as it were; it is confined to such areas as are most frequently excited in a massive way with a strong affective accompaniment. Its own lips, mouth, and cheeks, as interested and engaged in nursing and in being fondled; its abdomen as pressed by its clothing or by the hands of the person dressing it; its limbs as grasped and held to move it or to restrain its movement, etc.—these *are* the tactual body of the young child.

In breaking up this "gross mass" of sensation-complexes, mainly of pressure as characterized by a strong tone of feeling, into finer and finer discriminated areas, sensations of motion precede sensations of position in respect of effectiveness. As Professor James has well said,[1] "in the education of spatial discrimination (of the areas of the skin) the motions of impressions across sensory surfaces must have been the principal agent." The smaller areas and spots of the body's surface, when simply pressed upon or hit, are located because the sensation-complexes thus called forth are associated with ideas of sensations of motion previously excited. *In general, it is the discriminable difference between two most nearly alike sensation-complexes derived by motion over the skin which sets the extreme limit to our tactile perception.* In further illustration of this fact is the experiment which shows that, if one of the two points of a pair of compasses be prepared so that it can be given a rotary motion, suddenly rotating it will almost always make the

[1] The Principles of Psychology, II., p. 175.

points seem as two, when just previously and at rest they have been felt as only one impression.[1] Here, of course, the principle is precisely the same whether the object moves over the surface of the skin, or the skin moves under the object. Changes in the sensations of pressure, without associated images of motor sensations, seem never alone to afford the data for locating minute areas of the skin (comp. p. 147 f.).

§ 10. Another most important means for locating the minuter sensation-areas of the skin is customarily too much overlooked. In the case of all stimulation of definite pressure-spots—especially, of course, where the stimulation is intense and accompanied by pleasure or pain—there is an immediate tendency toward definite and appropriate motor reaction. If, for example, one is stung by an insect on some particular spot, one immediately starts, withdraws, if possible, the area attacked, and perhaps reaches out a hand to remove the irritation. Even in the case of the gentlest stimulation, if we wish definitely to locate its point of application we are prone to make an inchoate movement with some movable member which serves, on a basis of past experience, as an *index* to that point. The opposite of this is that vague "feeling about" for the precise spot affected, which children exhibit, and in which adults are often engaged, especially if the spot be one with which they are not previously well acquainted. Now instead of its being true that this motor reaction gives evidence of definite localization already accomplished without it, the rather is it true that the conative impulses and motor sensations, with their associated ideas and feelings, are a prime means in accomplishing such localization. It should again be observed that all ideas of whereabouts our skin is pressed or hit are ordinarily given in terms of the visual picture of our body, by a process of translating sensation-complexes of skin, muscle, etc., into associated perceptions of sight. If, then, we remove all influence from actual movements, or attempts to move, and all assistance from associated visual percepts, what remains by way of direct perception, in terms of pressure-sensations, of the minute areas of our skin, is relatively meagre and vague.

§ 11. *The orienting of our entire bodies, and of their grosser masses with reference to one another, in "surrounding space," requires a previous construction of space and spatial relations, which, in the case of all not born blind, is chiefly the work of the eye.* But how is the direction of objects, and the position of our bodies with reference to them, both while we are at rest and while in motion, obtained with the eyes closed? Plainly the data for so-called "static" and those for "dynamic" perceptions and illusions differ to a considerable extent. Three sets of considerations are, however, of principal value in both conditions. Perception of the position and motion of our bodies depends upon (1) muscular and joint and cutaneous sensations—including general sensibility appreciating the gravitation of fluids and of internal organs of the body; (2) sensations coming from the muscles of the closed eyes, especially when the eyes are turned in their sockets from the primary position, or the head is twisted to one side; (3) sensations due to variations in the pressure of the endolymph in the passages of the ear, due to the position and motion of the head on its varying axes. [It will then be observed that, as a man's head is "*perceived*" by himself to be localized, so, chiefly,

[1] See James: Ibid., II., p. 170 (note).

are he and all things else located with reference to each other. But with the head "turned," all else gets awry.]

Already, however, we have repeatedly been compelled to assume some Perception of different parts of the Body, as objects separable from each other, or of our entire body, as one object separable from others, in space. This form of perception implies that not only "localization" but "projection" and "objective" cognition is to a certain extent advanced. We are really turning back in time, then, when we consider how the perception of the spatial qualities and relations of bodies outside our own body is gained by exercise of the organs of skin, joint, and muscle. But here again other bodies are, at first, somewhat vaguely set off from our own body by combination of spatial series of sensations, in which sensations of motion take a most conspicuous part. These other bodies are also primarily known "in the mass," as it were; repeated acts of discrimination, on the basis of repeated revivals of associated mental images, and of affective and conative accompaniments, with increasing minuteness of analysis and power of grasp in synthesis, are necessary to complete such cognition. The ultimate reasons for this process of setting off *other* bodies from *our own* body ("localizing" some experiences and "projecting" others), so far as such reasons lie in the realm of sensation at all, consist of discriminated differences between different spatial series. But to this statement must be added that (1) some spatial series combine as data for perception of an object with a marked accompaniment of feeling, are vividly colored with pleasure-pains, while others are comparatively toneless as respects feeling; and that (2) some spatial series are connected with our conation and consciousness of self-activity in such a way as to seem dependent upon volition, as other spatial series are not. Thus are the data furnished for that process of "diremption" (or the dividing of all our conscious experiences into two great classes), which culminates in the intellectual cognition of the bodily "self" and of a world of "things" as set over against the self.

It is manifestly by use of the skin, muscles, and joints, together with vaguer and more interior sensation-complexes, that we gain our immediate awareness of certain qualities of external bodies. In respect to some of these qualities of bodies, touch (in the broader meaning of the word) gives us our leading, or our only direct means of perception. In respect to other of these qualities, touch and the other organs of sense named co-operate with the eye, while being led by it with its finer and

prompter powers of discrimination. Among the former class are the solidity (or *sense-reality*) of bodies, their weight, inertia, impenetrability, and the structure of their surfaces, as smooth or rough, and of their substance, as hard or soft, tough or frangible, elastic or inelastic, etc. To the latter class belong the extension-qualities of external bodies; and these, as including their outline, form, size, and distance from each other in space. It is not the business of psychology to consider these qualities from the point of view of the physics of masses or of molecules; but from the point of view of the mental activity which constructs them in terms of space-intuition. And even from this point of view we can give only a brief statement of a few of the most important particulars.

§ 12. Undoubtedly the infant perceives external objects (though in the same vague and incomplete way as that in which it localizes its own body ily areas) before it has made any detailed conquest, by perception, of its own body. This process of discrimination is made possible, and indeed compelled, by his experience with his own sensations, feelings, and conations—given the power of the mind to form space-intuitions at all. Such a process is helped on, in special, every time a moving member of his own body encounters resistance from some outside body; every time also any external body is moved over the surface of his own body, or so brought into contact with it as to excite strong sensations of pressure and temperature, and is then removed. These are the very conditions which we have seen to be favorable to "differentiation" (p. 297 f.). For example, let us suppose that the arm is moving through a certain arc, from X to Y. Then A in motion $= (s, s^1, s^2, s^3, \text{etc.})$, $(m, m^1, m^2, m^3, \text{etc.})$, $(j, j^1, j^2, j^3, \text{etc.})$, (compare p. 335 f.). But now, let this series be interrupted at a certain point $(s^2 + m^2 + j^2)$, and another wholly different series, tinged by strong feelings of effort and pain, take its place. This *new* series consists of such skin sensations as are produced by striking or pressing against some external object, of muscles brought to arrest, of joints compressed, etc. Furthermore, it is not in the nature of the young animal thus to be resisted in motion without reacting in the form of increased conation. Pushed against, he pushes back; and the combined spatial series undergoes further change through feelings of strain and effort having both a peripheral and a central origin. It will finally appear that *all our so-called immediate knowledge of things depends largely upon the vivid arousement of our feelings with their pleasure-pains, and upon our own forth-puttings of will.* All these classes of elements are involved in the most primitive differentiation of my body from other bodies. For (1) spatial series of sensation-complexes and systems of spatial series, which are habitually accompanied by feelings of pleasure or pain, are localized as parts of our body; and other series and systems, not thus accompanied by feeling, are projected as external objects. (2) Spatial series, and systems of spatial series that are dependently connected with our volitions are perceived as movable members of our body; and other series and

systems, not thus dependent, are perceived as bodies separate from our own, and as opposed to the movement of our body and its members.

Moreover, when the child is gripped by the mother or nurse, and the motion of its limbs in necessary reaction upon this stimulus is impeded; when it is thrust into the bath or held down by its own weight against the bed; when it is bound tight in swaddling bands and then these bands are removed; even when a fly or a drop of water lights upon some area of its skin, and then, after failing to disappear in answer to its unguided movements to remove it, finally goes away "of itself;" in all such experiences, similar data for making the necessary distinction between "my body" and "other bodies" are furnished. In the same direction does its taking of food with the bulk of appliances in the mouth and the movable bolus, or swallow, operate. While it is constantly giving itself lessons in making the distinction between its body and other things, by striking itself with its own fists, kicking itself with its own legs, etc. Thus it is at one time hit in two places (two separable and painful sensation-complexes arise simultaneously, as when it strikes its own forehead with its own hand); it is thus induced to distinguish two parts of its own body, one of which may be an external object to the other. At another time, however, similar vivid sensations arise from a blow given by some external object, and only one impression lingers in consciousness; thus the removal of the object giving the blow is now no longer connected with the same motor consciousness.

§ 13. Such vague differentiation, chiefly by means of affective and conative accompaniments, is made far more clear and precise by the detailed exploration of active touch. And here the hand and fingers are the chief organs of perception. As they move, even when unguided by definite purpose, over the other surfaces of the body, two distinguishable series of tactual and muscular sensations result. One of these series represents "touching" something "with the hand;" the other represents "being touched" by something; together, they represent "touching myself with my own hand." But when the object explored by active touch is another body than my own, only one of these series is present as referable to any bodily area. This series, now present, is also changed in character and delimited by an object ready to resist my active touch, but without the passive sensations of being elsewhere touched. [Let anyone bring out this difference in sense-experience by running his finger slowly over any area of his own body, and then comparing his sensations thus derived with those that are produced by exploring the smooth surface of the table with the same finger.] Here again the great influence, and the imperative necessity, of evoking sensations of motion in order to nice discrimination of extended areas, becomes apparent. One authority [1] has rightly argued that little or no perception of the extended surface of objects can be gained by pressing them against the skin: the blind, he claims, never proceed to measure surfaces this way, but only by running the finger along the boundary lines. It is true that by such sensation-complexes as are evoked merely by pressure, an adult is capable, as Weber showed, of distinguishing the circular form of a tube 1½ Parisian line in diameter on the tongue, and 3½ inches on the skin of the abdomen. Granting that this is to be spoken of as proof that an im-

[1] M. Ch. Dunan: Revue Philosophique, 1883.

mediate awareness of the form of objects *may* be gained by pressing them against the skin, there can be no doubt that our perception is, in fact, ordinarily not so gained. It is by "handling" itself and other objects, under influence from changing affective and motor accompaniments, that the child actually develops the perception of the spatial differences and of the limits in the extension of things. In these cases, as in all others, the ultimate limits of discrimination are set by the discriminable sensation-complexes; and among them all, chiefly by those of motion implying perceptive use of hand and fingers. And to those who have experience of sight the merely tactual extension of an external object is but a fragmentary and sorry space-intuition of that object.

§ 14. The truthfulness, in the main, of the foregoing representations may be partially demonstrated by appeals to developed experience. To illustrate how the stream of consciousness may be changed all the way from a delicate perception, by means of pressure sensations, to an intense and massive "realization" of the existence of an external object, let the following simple experiments be performed. First: repeat the experiment already referred to (p. 116 f.) by closing the eyes, placing the tip of the finger lightly against some solid object, and considering alternately the localized sensation of pressure as such, and the perception of the external thing as something pressed against. Then gradually increase the pressure until your whole being seems to be engaged in exertion resisted by this thing. At every stage it will be possible, either to regard chiefly the localized series of sensation-complexes belonging to your own bodily members, or the objectified series of sensation-complexes constituting the thing at the end of your finger. But, as feeling and active motor consciousness become more and more intense, the perception of body other than your own will become more difficult. Second, draw your finger gently over a knife-blade or press it lightly against the knife's point. You may thus either perceive the quality of the edge or point, as sharp or dull, sharp or blunt, etc.; or you may perceive the affection of your own finger as being rubbed or pricked, with an accompaniment of slightly painful feeling. Let now, however, the pressure be increased, and the finger cut or pricked, and perceptive attention is quite compelled to neglect the *other* body, and to concentrate itself upon the painful sensations localized in *your* body. Again, contrast the "cool" mental condition, the nicely discriminating "objective" consciousness, which maintains itself as—with eyes closed—we carefully feel out the details and mentally construct the touch-picture of some complex tangible thing, with that state of pleasurable or painful awareness of the depths of our own bodily being, as it were, and that warm conviction of the envisaged reality of other bodily being, which wrestlers or contestants in a game of foot-ball have.

§ 15. The superficial qualities of other bodies are also perceived by touch, chiefly through the activity of the movable members of our own body. Thus bodies are known as "rough" or "smooth" by the successive sensation-complexes produced as the hand moves over them. In the one case (perception of roughness) muscular sensations, etc., indicative of motion of the hand, are successively fused with disagreeable and dissimilar pressure-sensations; in the other case (perception of smoothness) with those which are agreeable and similar, as respects intensity and compound quality. The percep-

tion of "hardness" and "softness" requires the emphasis of muscular and tactual sensations that are developed as the moving member is more or less resisted, and brought to a standstill, in its attempt to move. If this perception is extended far enough to determine the moldableness, under active touch, of the entire mass of the body perceived, the body, rather than simply its surface, is said to be hard or soft. Thus the series of sensation-complexes, and of fused images, with their affective and conative accompaniments, are markedly different when we are handling a piece of metal and a mass of putty. Temperature-sensations in such cases often play an important part.[1] They assist, for example, in forming our perception of surfaces as moist or dry; and even, it seems probable, in all cases where different degrees of "friction" and "sticktion" are involved. We can scarcely move the skin over roughish surfaces without producing slight excitations of the temperature spots. Wunderli showed that the sensations produced by lightly touching the skin with cotton, and slightly warming it by approaching a heated surface, through a square opening in a piece of paper, may be mistaken for each other. And if Weber observed that cold bodies resting on the skin often appear heavier, and warm, lighter, than they really are; and another experimenter (Szabadföldi) showed that small wooden disks heated to 122° Fahr., often feel heavier than larger ones not so warm, the contradictory results combine in demonstrating the influence of temperature-sensations on the formation of perceptions of touch. The exceeding smoothness of polished marble appears also to be somewhat dependent upon its being felt cold to touch.

When we are not able actively to combine and unlock the different spatial series (tactual, muscular, and temperature) by moving the more delicately perceptive organs of touch over the surfaces of other bodies, we get only a relatively incomplete and inaccurate perception of the qualities of these bodies by having them moved over the surfaces of our own body. Here the variations in the sensation-complexes produced are exceedingly delicate and promptly appreciated, but they excite an interest, not in that *other* body, but in *our own* body as being touched. Hence such sensations of motion serve the purposes of localization rather than of perception of an external and extended object. It is extremely unnatural and correspondingly difficult to perceive the surfaces of things by having them moved over the surfaces of the skin. Yet in this way perception of the smooth and the rough, the moist and the sticky, the dry and the superficially hard, etc., may be obtained. In all such cases, however, the data of sensations and representative images, and the nature of the psychical activities involved, have already been sufficiently explained.

§ 16. In the perception of those qualities which chiefly make things "solid" and "real" to us, the massive muscular and joint sensations are particularly emphasized. But these are habitually called out only as we exert ourselves against external bodies, with a view either to move them or to prevent ourselves from being moved by them. In this exertion of ourselves—and the more, the greater such exertion is—the so-called "feeling of effort," or "feeling of innervation," or "active motor consciousness," is involved. Moreover, such exertion is accompanied by a condition of the

[1] Compare Funke, in Hermann's Handbuch d. Physiologie, III., 2, p. 330 f.

organs of touch (the muscles and joints especially, but also the skin) which results in throwing in upon the brain a great variety of the most voluminous sensation-complexes arising in these organs. When we are exerting ourselves, the muscles are contracted strongly; the joints are set together; the skin is stretched tense over the muscles "bellied out." Other less definitely localizable muscular and tactual sensations are occasioned by the changed character of the respiration and circulation, by the condition of epiglottis, of the jaws, and even of the facial muscles, etc. Such changes in the peripheral organs of sense cannot take place, however, without the production of more or less of that "chaotic overplus" (see p. 175 f.) of cerebral excitement in which the physiological basis of our bodily feelings consists. It follows, then, that our perception of bodies as solid and externally real is largely dependent upon the affective and conative coloring of the stream of consciousness which accompanies certain of our muscular, joint, and tactual series of sensation-complexes. Anticipating what is progressively becoming clearer: *we know bodies really to be, and to be really "out" of us, only as we feel strongly and will intensely.* In other words—to return to our present point of view—*we perceive other bodies as having weight, inertia, etc., by comparing together spatial series of sensation-complexes that are, chiefly, wide-spreading and strong muscular and joint sensations, fused with intense consciousness of effort (or conative activity) and affective modifications due to superinduced strain of the organs of touch.*

The experiences of the infant, already referred to, constitute its early training in perception of the solidity of other bodies than its own. Reference has also been made to adult experiences illustrating the same considerations. In understanding further the origin and development of such immediate awareness of the qualities of other bodies, the following three points must be considered:

(1) *The perception of the solidity of external objects cannot be gained without experience of motion actual and resisted by means of the solid masses of our own body.* For, this perception involves a combination of perception of extension in the third dimension with perception of weight and inertia. But extension in the third dimension cannot be given in terms of touch—simply by moving other bodies over the surfaces of our own body. It implies movement of the movable members of our body in a way to call out spatial series of sensations which differ from those called out by motion in the other two dimensions. Of the marked difference which exists among the sensation-complexes belonging to the three dimensions, anyone may convince himself who will compare his experience, in terms of touch, when moving a leg or arm forward and backward with that had when moving the same limb sideways. All this, doubtless, is at first exceedingly vague; and, indeed, it remains very vague, because of our irresistible tendency to translate movements in the third dimension into terms of sight. The possibility of making this discrimination is implied in the perception, by touch, of the extension in three directions of other bodies. But this third dimension, like the other two, would not be "filled up" with an external body unless we had perception of weight and inertia. This perception is gained by having our movements more or less resisted, with all the experience which such resistance involves. Thus, if we find that our attempts to move in all possible combi-

nations of the three dimensions of extension are resisted, we perceive an extended and solid body other than our own. And this body may be soft or hard, fluid or viscous or solid (in the narrower meaning) according to the way that it (especially at its surfaces) resists our attempted movements.

(2) *The comparative perception of solid bodies depends upon our estimate of the various factors which enter into our perception, in general, of the solidity of bodies.* And here emphasis may be laid upon that one of these several classes of factors which, for any reason, attracts attentive discriminating consciousness to itself. But, ordinarily, bodies are perceived as more or less extended in all directions by a tactful interpretation of the combined resultant of several series of these factors. Those psychologists are wrong, then, who deny the influence and value of any of these several series of useful factors. By muscles, joints, skin, feelings of effort, and affective results, *all taken together*, we perceive the extended being of other bodies than our own. And, as we shall subsequently see, errors and illusions of sense arise when the attention is actually caught by one set of considerations and induced to give it undue influence. On the other hand, we can get along fairly well if we have to dispense, wholly or partially, with some of our customary data of perception. The primary question, however, is not what we *can* do, when we are compelled by being put in artificial conditions; but what we *do actually* accomplish in perception, with all the means ordinarily at our disposal. Thus Goldscheider and James are right enough in emphasizing the value of joint-sensations (the latest "fad" in experimental psychology on this subject); since with anæsthetic skin, or suspended, or fixed in a plaster cast, the joints of leg and finger can appreciate motion. But they are wrong in minimizing or denying altogether the value of those sensations of skin and muscle, on which other investigators show by experiment that part of the burden of discriminating consciousness should be laid.

Especially important in comparative perception of the weight of bodies is the way in which our previous estimate of the amount of resistance to be expected is met by the amount of resistance actually offered when the attempt at movement begins. Bodies that move easier than we expected appear lighter than they are; bodies that move only after more than the expected resistance appear heavier than they are.[1] Our mental image of the speed with which bodies yield to our resistance also determines the perception of their inertia and weight. Moreover, phenomena similar to those of complementary color-sensations are to be observed in the case of our perception of weight. Lotze remarked that, after standing for a long time with weights in both hands and then laying them down, we seem to be rising or drawing our arms up toward our breasts. This phenomenon, like those of contrast generally, is probably of central origin. In fine, all our experience illustrates the fact that every individual case of perception of this order is the solution of a complex problem in the interpretation, on the basis of past experiences, of a great variety of data having both a peripheral and a central origin. According as, not only the data of series of spatial sensations vary, but also of associated ideas, and affective and conative accompaniments, will perception in its various forms take place.

(3) *Our perceptions of the different properties of bodies, in terms of touch,*

[1] See article by Müller and Schumann, Pflüger's Archiv, xlv., p. 37 f.

depends solely on the differences in the mode of the fusion, and extension in series, of the different psychical factors which enter into our perception of external body in general. Thus the differences in the weight and the inertia of bodies, as directly perceived, depend upon the differences in the complex states of consciousness called forth when we attempt to move them, either away from the earth (lift them) or before, or behind our own body (that is, push or pull them). Their differences in shape depend upon the succession of conscious states, in terms of touch, which we get when we move over their surfaces, and yet find ourselves constantly resisted in the effort to move in directions other than those not "occupied" by the body. "Shape" and "solidity," then, imply each other to touch; but one property lays emphasis on certain phases, the other on different phases, of the complex experience of active touch. So, all the way along the development of perception by touch, discrimination and interpretation of the elements compounded in the stream of consciousness is necessary.

§ 17. The so-called perception which we have of the properties and relations of bodies that are not immediately in contact with our organs of touch is indirect; it is of the nature of knowledge by inference and association rather than an immediate awareness of these properties. Here, knowledge is first gained by the eye (in ways to be explained in the next chapter), and is then translated into terms of touch on the basis of previously associated and inferred ideas. Thus our perceptive consciousness, when we are looking at a mountain we are about to climb, at an object marking the distance to which we wish to throw a stone or a ball, at the height of the wall or fence over which we wish to jump, at the size of some weight of known substance which we propose to lift, etc., is strongly tinged with faint tactual, muscular, and joint sensations, feelings of strain and effort, and revived images of similar sensations. These are all stimulated, as it were, by the localized sensations of color and light. In fact, it is difficult for us to *perceive* any distinct object, as having spatial qualities and relations that are known immediately to active touch and to muscular effort, without responding to the challenge which it affords to *conceive* of it as being brought into the sphere of our motor consciousness. Thus the eye, if we would vividly realize the world of space-intuitions which it presents, furnishes invitations that rarely or never fail to meet response. Vision invites us to rehearse how we should feel, if we went "there," and handled "those" objects, and mastered the now merely seen, in terms of our own bodily action. In this living "motor consciousness," which never forsakes us, the whole world of external objects has its life. We can scarcely see the stars "as distant" without conceiving of ourselves as flying thither on wings; that is, we translate the visual stars into terms of motor-consciousness. The "bulk" of those worlds and the mighty "forces" of nature are no reality—are mere pale abstractions—unless we think of the immense sensations of strain and feelings of effort that would be called forth in the consciousness of one who should attempt to lift or to push them, to hold them back or to make a stand against their motion. It is the more necessary to insist upon this leadership of motor consciousness in our knowledge of external objects as solid and *real*, because we are about to insist, equally strenuously, upon the leadership of the eye in many forms of space-intuition.

In marking the transition between the two geometrical senses we may again observe: How meagre and fragmentary is the picture which we can frame, whether of our own body or of other bodies, in terms of skin, muscles, and joints, etc.! Our more distinctively motor consciousness of extended and external objects is indeed warm and life-like; it is always able to appeal to our affections and to our will, in a very direct way. But considered as independent of sight it is, for those who have sight, almost inconceivably narrow and incomplete. For the blind, the larger part of our world of external and extended objects is a "solemn silence;" and most of the rest of their world is a "wandering of noises." Even the pictures they form of their own bodies, and of other bodies in contact with theirs, are, as respects their spatial properties and relations, almost totally different from ours.

[Besides the references already made in the notes, the particular sections of the larger and more modern treatises on psychology (respecting perception in general and perception "by touch") should be consulted. Of all in English, that of Professor James (The Principles of Psychology, II., pp. 76–324) is by far the best. For emphasis, however, on certain points he has relatively neglected, see Bain: The Senses and the Intellect, pp. 59–100, 159–190, 360–488. Wundt: Grundzüge d. Physiolog. Psychologie, II., pp. 1–41. Spencer: Principles of Psychology, II., vi., chap. 13; and Sully: The Human Mind, I., pp. 204–235. Monographs containing much of interest are those of Max Dessoir: Ueber d. Hautsinn. Féré: Sensation et Mouvement. Stumpf: Raumvorstellung. Hoppe: Scheinbewegungen. Abbott: Sight and Touch. Drossbach: Objecte d. sinnlichen Wahrnehmung. Stout: Mind, xv., p. 88 f. Uphues: Wahrnehmung u. Empfindung.]

CHAPTER XVI.

PERCEPTION BY THE SENSES (*Continued*)

THE world of external and extended objects, which stands (apparently "ready-made") before our open and attentive eyes, is a most marvellous achievement of the perceptive faculties. With such obvious instantaneousness and clearness of outline and of relations do these objects often appear, that it is natural to regard vision as resembling the impression passively received by a photographer's plate rather than as the result of mental activity. Even in those cases where vision is attained only after purposeful effort and an appreciable time, it is ordinarily the objects in which we are interested rather than in the part we take in perceiving them. But psychology, true to its scientific work of explaining states of consciousness as such, requires an account of the genesis and development of this marvellous mental faculty. For Perceptions of Sight are undoubtedly the results of development. It is a "far cry," indeed, from having sensations of color and light, vaguely big or voluminous, to perceiving the spatial qualities and relations of things with a practically instantaneous activity of the eye; and the question, By what means, stages, processes, and mental activity does the construction and elaboration of a "field of vision" take place? is one of the most difficult and profound of all the questions which psychology undertakes to investigate.

Many of the subordinate questions concerned in our theory of the Development of Vision never have been, and probably never can be, satisfactorily answered. So far, however, as the brief answer which will now be given is concerned, most of its data have already been considered in detail. A brief enumeration of them is in place here. (1) There are several "spatial series" of sensations belonging to the activity of the organs of vision which, by their fusion in manifold ways, furnish an exceedingly complex and delicate system of discriminable "local signs." (2) There are representative images of these sensation-complexes which become associated with one another and with the sensations, or by the process of "condensation" of series become indistin-

guishably fused in the total psychosis. (3) There is a constantly developing power of discriminating consciousness, considered as involving assimilation, differentiation, and all the processes of primary intellection. (4) There is ever-present attention, in its most primary and then more developed forms, with its constant changes of focus and process of redistribution —finally becoming a consciously selective, purposeful, and exploring director of the activity of the eye. (5) There are faint accompaniments of affective and conative origin—far fainter, however, as a rule, than those belonging to perceptions of touch —which tinge these visual psychoses and give to them "life" and "reality." (6) There is constant association with the synchronously developing field of touch, with its perception of spatial properties and relations by skin, muscles, and joints; and there is a subtile process of "interpretation" of one in terms of the other constantly taking place.

It is only by constant reference to the foregoing truths (already established) that we can explain—so far as explanation is possible at all—the development of visual perception. In the case of vision—even more, if possible, than in the case of the other geometrical sense—genuine *explanation* comes to an end in the presence of the admission that somehow, and at some time, the fused sensation-complexes and representative images produced by activity of the eye appear as "presentations of sense." The resultant of sensations and of other mental factors appears as "objects" endowed (we are forced to say, by the native power, or according to the natural laws, of mental life) with spatial properties, standing in spatial relations.

§ 1. The "data" of visual perception in the form of discriminable variations belonging to the sensational elements are at least as numerous as the following: (*a*) Sensation-complexes of light and color, of varying qualities and intensities, due to simultaneous excitement of contiguous nervous elements of the retina; (*b*) sensation-complexes of tactual and muscular order, due to movement of the eyeball in its socket; (*c*) other sensation-complexes due to accommodation of the eye for near distances. As already said, these combine with (*d*) associated images of past sensations of all three kinds—suggesting each other and suggested by the sensations themselves; and with (*e*) faint accompaniments of conative and affective consciousness, making the visual object to be presented as the resultant, in part, of feeling and will. But (*a*) and (*b*) may be regarded as the chief sensation-elements determinative of the extensity of the visual object in its most primary presentative form.

§ 2. The more developed perception, by vision, of the spatial properties of bodies as extended in three dimensions, and of their relations in the third dimension, involves a variety of secondary factors which will be

noticed in their proper place. In all vision the fact that we have *two eyes*, which, however, act as *one organ*, is most important. An account of the construction of the field of vision involves three stages, which, for purposes of convenient presentation of theory may be successively considered. These are (1) the conditions which determine the formation of a retinal image with the eyes at rest; (2) the single eye in motion and the influence of its movement; (3) the conditions furnished by the existence and relations of the two eyes exercising their functions in common. It should be borne in mind, however, that this order does not follow the natural development. *From the first both eyes are actually exercising their functions in common.* And the vision of objects, extended and external, with one eye at rest, instead of being the simplest, easiest, and earliest form of vision, is its latest, most difficult, and—considering the amount of associated ideation and so-called "instinctive inference" necessary—most complex form.

A yet more highly developed knowledge of things, by vision, involves the use of the eyes with movements of the head around its axis, and of the entire body. For much of what we call "seeing" things is actually accomplished by interpretation of muscular sensations, localizable in the neck and upper part of the trunk. Here also assistance is derived from the fluids in the semicircular canals, which we have found to influence the orienting of ourselves in space, and of all other objects as related to ourselves. Indeed, we *see* all things in surrounding space according to our perception of our own position with reference to the earth; and this perception is primarily a matter, not so much of sight as of skin, muscles, joints, and interorganic sensibility. Hence everything "looks" very different when we stand on our heads; or when we regard the field of vision with our head between our legs, or even with our head twisted to one side.

Moreover, perceptions of sight proper are constantly interpreted in terms of touch; they even have elements from perception by touch inextricably fused with the truly visual elements. Certain properties of bodies—such as their smoothness or roughness, softness or hardness, etc.—are known to sight, only as inferred from previous association with touch. It will appear, however, that vision of the third dimension by the eye is possible; and that we develop an "immediate perceptive consciousness" of the extension and relation of bodies in this third dimension. Here, again, visual perception of this dimension is a quite different consciousness from tactual perception of the same dimension. But a translation of one into terms of the other is constantly taking place; and this makes possible a more complete and useful knowledge of the spatial properties and spatial relations of visual objects.

Sight differs markedly from touch in that the knowledge of our own body by sight comes in precisely the same way as the knowledge of other bodies. That is, by skin, muscles, and joints, I become immediately aware of my body as being "locally" affected; but the expanses of the active retina or the sockets of the eyeball are not perceived by sight. By sight, on the contrary, I know the different areas of the body which can be brought into the field of vision, in precisely the same way as that in which I know all other objects in that field. My *body* is externally perceived by sight; interiorly so, as my sentient organism (as *myself*), by touch. This fact taken in con-

nection with the faint character of the conative and affective accompaniments of vision, gives to sight its more purely intellectual and cool objective character. This fact also makes it impossible to draw, in the case of sight, the same distinction between "localization" of the bodily areas and "projection," so called, of the external and extended object. From the first, and continuously, the extended visual object (*quoad object*) is projected as external to the organ of sense.

Even in the simplest and most naïve possible form of adult vision, the object appears to arise immediately in consciousness as an extended and external mass of light- and color-sensations. In other words, all bodies are perceived by the eyes as colored surfaces in three dimensions. In this perceptive process we are customarily unconscious of the passage of time while the presentation of sense is being constructed; unconscious also of activity either in the way of controlling the focusing and distribution of attention, with motionless eyes, or of moving the eyes over the object in exploration of its different minuter areas. We seem to ourselves to be passive, like an extremely sensitive photographic plate on which a complete impression of the object is made by instantaneous exposure to the object. More analytic observation shows us, however, that the accuracy and range of our visual perception of objects does depend upon time; and that, as a matter of fact, we cannot see an object—especially if it is at all complex—without constructing it with a wandering point of regard and a moving organ of vision. *Visual perception is, then, like every form of mental life, a process in time and requiring mental activity.* This complex process involves all the elementary forms of mental life; it includes, of course, attention, ideation, and motor consciousness as dependent upon conation.

Suppose, however, we make the effort to exclude all influence from present motion, and from past experience; and thus reduce the field of vision to its lowest terms. We open one eye, and try to keep this perfectly fixed. Yet even now, with a practical instantaneousness, we behold the objects set—themselves extended in three dimensions—in spatial relations to us and to each other. This monocular field of vision is reduced in area however; the images in it are perhaps less clear and stereoscopic. This practical loss of area, clearness, and apparent solidity, is due to the inactivity of the other and closed eye. What it is which this other eye still contributes to the total field of vision we can partially discover by directing attention to its side of the field. There we shall find a dim color-mass, located beyond the nose, and perhaps blending with its rather obscure outline into the more "objective" field of the open eye. Now, however extreme

our "nativism," we cannot appeal to consciousness in proof that this motionless monocular field is independent of preceding experience with two moving eyes. For what we see, even in this way, is not mere extensity or voluminousness of color-masses; it is familiar objects, like trees, hills, men, horses, buildings, with all the spatial qualities and relations—only somewhat less clear and stereoscopic—that belong to vision with two moving eyes. Such seeing of objects is undoubtedly the achievement of mind in a course of development; it implies volition, memory, imagination, and intellection, practised upon these same objects over and over again. Therefore we cannot understand this motionless monocular field, except by reference to what has been previously gained of perceptive faculty by the use of two eyes in motion.

Once more let us try to exclude from our problem all that is confessedly the result of experience. We now close both eyes and keep them motionless; again the vague light- and color-mass with its three-dimensioned extension and indefinite outline appears in the guise of an external visual object. Or—in obedience to the request of some ardent nativist—we "lie on our back on a hill" and let "the empty abyss of blue fill the whole visual field," or look from its top with "inverted head" at the uttermost horizon and notice the "startling increase in the perspective." We then raise anew our question: Whence comes this "immediate awareness" of the "voluminousness," in all three dimensions, of our sensation-complexes of light and color? To this question, so far as an answer seems possible, the following must be replied: *All visual perception, even the most primitive, requires the fusion of sensation-complexes of light and color, which are discriminable as "local signs of the retina," with other sensations and images of sensations, of a tactual and muscular order, due to motion of the eye.*

§ 3. In support of the foregoing conclusion reference should be made to what has already been said of the primary nature of sensations of motion, and the derivative character of sensations of position, as implying previous experience with sensations of motion. The existence of *both* a system of retinal signs, which makes possible a nicety of local discrimination by vision surpassing the finest tactual and muscular work, and *also* of constant aid in the construction of the visual object by use of the motor apparatus of the eye, must be again admitted (see p. 153 f.).

On the one hand, we have seen that the structure and use of the retinal areas show such a system of local signs to exist. But, on the other hand, the use and development of this system is from the first accompanied with motion of the visual organs. Preyer[1] and others have observed infants

[1] The Mind of the Child. Part I., p. 43.

moving the eyes so as better to fixate an object which was first seen indirectly, as early as within a fortnight (eleventh day) after birth. It cannot properly be said either that the primitive bigness of the object belongs wholly to the muscular sensations and then gets associated with the retinal signs (so Münsterberg and others); or that this bigness belongs wholly to the retinal image, regardless of muscular sensations, and then is only "measured off" by changes in the intensity of muscular sensations (so James). We must rather say that, *from the first appearance of a visual object, its extension is perceived in dependence upon both the character of the retinal signs excited and the sensations of motion, or images of past movements, fused with these retinal signs.*

§ 4. In spite of our best efforts it is difficult to hold the organs of vision motionless. Some slight, inchoate but largely inhibited movement generally accompanies all direction of the attention to any particular part of the field of vision. This is so when we attempt to fixate any particular area, or single speck of color or light in the retinal field, with both eyes closed. When only one eye is closed, the attention cannot be fixed upon the color-mass which represents the field of the closed eye, without turning thitherward the open eye. Where sensations of motion arising from actual movement are suppressed, sensations of strain or tension may take their place. Thus—to recur to facts already treated—Holmgren's[1] experiments showed that in looking fixedly at very faint and fine points of light, the image seems to move constantly upward, if the eyes are somewhat elevated. That is, the sensation of continued tension expresses itself as a sensation of continued motion, in the direction of the muscular exertion. Moreover, there appears to be a pretty constant relation between the special sensibility of the eye as the organ of vision and the general sensibility of its integuments. Troubles in the latter, due to cerebral lesion, are accompanied by troubles of vision, such as (not simply achromatopsy) concentric or lateral retrenchments of the visual field. The condition of the cornea and of the conjunctiva is also sometimes found to be concerned in hysterical hemianæsthesia. All this shows that *space-intuition by the eye is profoundly influenced by the tactual sensations connected with its motion.*

What would become of the "bigness" of visual objects if either the system of local signs and the spatial series of sensations connected therewith, or the movement of the whole organ and the spatial series of muscular and also of tactual sensations connected therewith, were removed? To this question we reply: Such "bigness" would never appear. In other words, the most primitive construction of a visual object requires experience with all these sense-data.

As soon as we admit the Influence of Sensations of Motion upon Visual Perception of the relative magnitudes and distances of objects—these objects being already perceived as extended and external—the problems connected with the development of vision become comparatively easy of solution. The entire structure of the organ of vision designs it for motion. Indeed, with-

[1] Comp. Am. Journal of Psychology, iii., p. 206.

out motion the eye is not an organ of *perception*, in any intelligible meaning of this word. On only one small portion of the retina is it possible to form a clear and distinct image of any external object. But different objects actually stand in different relations to this central portion of the retina; and these relations vary, as the objects move or as the organ moves. Only by motion of the eye, then, can the organ be applied to the object. Only in the same way, if the object is at all complex and "voluminous," can the different parts of the perceptive process so be united in one field of consciousness as to constitute a single perceived object. If the eye could not move with great rapidity and be accompanied by discriminating, ideating, and synthesizing activity of consciousness, there could be no field of vision corresponding in extent to the number of objects, or parts of objects, perceived as a related totality. Moreover, it is only in terms of the magnitude and duration of the sensations evoked by motion that objects of any considerable size can be compared with each other, and thus their relative size and their relations in space be determined. Distances, in all of the three dimensions, are measured with a moving eye.

In this measuring activity by motion of the eye two classes of movement are possible. These are (1) movements of the eyeball, under the pull of one or more of its three pairs of muscles; and (2) movements of the lens and connected structures in accommodation, or in focusing for near distances. The former of these movements result in changing the series of both muscular and connected tactual sensations; the latter (although the mechanism of accommodation is still somewhat obscure) probably have the same result. In all this part of the perceptive process it is the course of the wandering of the point of regard over the outline of the object which determines the character of the result. And here the general principle (namely, that which controls in visual perception as dependent upon motion of the eye) may be stated as follows: *Every field of vision, and every object seen in that field, depends for its spatial qualities upon the changes produced in the muscular and tactual sensation-complexes by successive changes in the "point of regard."*

§ 5. When the image of any object falls upon a small spot in the physiological center of the retina (the *fovea centralis*) it is clear; but objects seen in "indirect vision," or whose images fall outside of this spot, are not so clearly perceived. Hence we have a natural and almost irresistible tendency to bring the image of any object which we wish to see clearly, to this point and to fixate it there. Without conscious desire or volition this tendency operates in the case of any bright object whose image falls upon the

retina, even of the very young child. That point in the object to which the center of the retinal area of clearest vision corresponds is called "the point of regard" (sometimes, "fixation-point"). The movement and fixation of the point of regard is accomplished by three pairs of muscles for each eye-ball; and thus this point may be moved on different axes of rotation about a "center of rotation" (really an interaxial space located some 13 to 14 mm. behind the cornea). Thus, also, the "line of vision" (a line drawn from the center of rotation to the point of regard) can be changed for each eye; and the "plane of vision" (or plane passing through the lines of vision of both eyes) can be shifted in various ways, starting from the "primary position" —head erect and line of regard directed toward the distant horizon. A variety of movements may be accomplished, and sets of positions successively assumed, by rotating the eye upon its axis, with or without combination of lateral and vertical displacements. In this way the practice of the moving eye, begun in the automatic effort to fixate the point of regard, results in establishing systems of sensations of motion and sensations of position, which serve to orient it, for every possible line of regard, by reference to a constant standard.

It is by comparison of sensations of motion and sensations of strain with one another, for all varieties of motions and positions and as fused with varying sensation-complexes of color and light, that we "size" the outlines of our various objects of visual perception.[1] Here again, however, we must recall the fact that the eye, like the skin, is especially sensitive to sensations of motion. By movement over the stationary retina the variously colored local signs are played upon. Hence, part of the data by which a moving eye appreciates a linear magnitude more exactly than does a fixated eye (as Münsterberg and others have shown, in fact), may be due to the service which movement renders in bringing into greater distinctness in consciousness these same variously colored local signs. Nor is it strange that the more practised the eye has grown, the less able is it to separate data which have become so inextricably fused into forms of objective knowledge.

§ 6. Only those objects which are seen by direct vision—that is, whose images lie in the line of regard when the eye is in its primary position—appear in their actual place. All other objects and their outlines appear out of their actual place. To test this, take a sheet of white paper with a black dot in its center, fixate this dot steadily with one eye only; and then straight slits of paper lying outside of the two meridians will appear bent. Both arms of a rectangular cross will, under the same circumstances as the straight slits, appear distorted. And in general all lines lying outside the vertical and horizontal meridians of the retina, in order to be seen straight, must be really bent; and all really straight lines in such positions are seen bent. *It is by a mental transposition, based upon our experience with moving eyes and thus enabling us to use the sense-data as corrected by associated images of previous sensations, that the spatial relations outside of the images on the meridians of the primary position are seen at all.*

§ 7. "There can be no doubt," says Helmholtz,[2] "that anyone who has much observed his own changes of accommodation and knows the muscular

[1] Here compare Münsterberg: Beiträge, etc., Heft, 2; and Professor James's note and admissions, The Principles of Psychology, II., p. 206 f.

[2] Physiologische Optik, p. 638.

feeling of the effort belonging to them, is in a condition to tell whether, when he fixates an object or an optical image, he is accommodating for a great or a small distance." Donders showed that spectacles of moderate convexity magnify not chiefly because they enlarge the retinal image, but because they relax the muscle of accommodation. This produces muscular sensations which compel us to place the object further off, and since its retinal image is not diminished, its perceived size is much increased. When the muscles of accommodation are paralyzed by atropine, we have to make the same strain to accommodate which would be necessary, in the normal condition of these muscles, for a much nearer object. Hence the size of the retinal image not being enlarged in proportion to the nearness of the muscular exertion, the object may seem much diminished in size.

Wundt, while experimenting to determine the value of muscular sensations of accommodation on the perception of visual distance (with which, of course, is connected the size of the object) found that *relative* position could be determined in this way with considerable accuracy—especially if the strain of accommodation was increased by approaching the object quite near to the eye. Helmholtz found the value of this datum for clear visual perception somewhat different for different colors. It may be said with confidence, then, that changes in the sensation-complexes produced by movement in accommodating for nearer distances have a considerable, but a somewhat fluctuating and uncertain influence, upon the perception of the spatial qualities and spatial relations of visual objects.

The fact that *two eyes*, with their two sets of motions and of changes in the resulting series of retinal images, are ordinarily concerned in the visual perception of objects, must now be considered. Each eye is a complete optical instrument, with its own point, line, and plane of regard, and its movements of rotation, torsion, and accommodation. The two eyes are then never mere optical duplicates. Psychologically expressed, this means that two systems of spatial series—fusing, uncoupling, fusing again—enter into the determination of the object of visual perception. And, yet again, the two eyes are, in some important sort, *one organ*. The main result of this twofold nature of the one organ is to emphasize the third dimension of our visual space-intuitions. It is chiefly by data thus afforded that we become immediately aware of objects which, to sight, are both single and solid; and of a field of vision in which such objects are set at different distances from each other. In other words, the data afforded by two eyes in motion are the chief *motifs* for stereoscopic vision. Such data of Binocular Vision, in order to account for their origin and influence, require two sets of considerations: (1) When both eyes are motionless, the images formed upon their retinas are symmetrical, or capable of exact-superposition, only under very limited conditions as respects the position of the eyes. (2) When both eyes are in movement, changes in the rela-

tions of their images constantly take place, which correspond to all the positions reached along the arc of motion. Of course, also, sensations of position and sensations of motion, of a muscular and tactual kind, as well as suggested images of such sensations, belong to every possible combination, in use, of the two eyes.

We see, therefore, that very complicated *motifs*—or systems of changing sensation-complexes fused with and suggesting mental images—are at the disposal of discriminating consciousness in every case of perception with two eyes. Hence the delicacy and accuracy of the tact which it is possible to acquire in this way. Hence also the difficulties, the errors, and illusions of various kinds which belong to visual perception. In fine: *stereoscopic vision is developed, principally on a basis of variations in the sensation-complexes, concomitant and closely successive, due to the stimulation of the different retinal areas of the two eyes ("local signs" of the retinas), combined with variations in muscular and tactual sensations due to their simultaneous movement*—each with its own axes of rotation, point of regard, etc. The very use of the two eyes, in ceaseless motion, as one organ, provides for the necessary repetition of the requisite spatial series of sensations, in every possible order, for their fusion into connected systems of sensations, and for the revival of appropriate representative images, under all possible conditions of motion and position.

§ 8. Those authorities are plainly in the wrong who (the prevalent theory in Great Britain since Berkeley) maintain the impossibility of "seeing" the third dimension of bodies, and therefore the necessity of translating all visual signs of this dimension into terms of touch. We just as truly become immediately aware of the solidity of bodies, and of their relations of distance, by the eyes, as by the skin, muscles, and joints. In other words, *stereoscopic* vision is *vision*, and is *not* mere *interpretation* of visual symbols *in terms of touch*. It has already been shown that, if we wish vividly to realize any visual object as solid or distant in space, we are apt to resort to the help of touch; we think into it how it would feel in case we could grasp it or push against it, or what our muscular and tactual experience would have to be in order to make what is over "there" to be "here," or "nearer" here, etc. Thus the "bigness" of the visualized tree is perceived more vividly through images of sensations connected with the purposed effort to throw the arms around it. The distance of the house or hill is realized better when I mingle with the activity of the eyes the revival of certain muscular sensations connected with walking, climbing, throwing a stone, etc. Nor would we deny that inchoate motor consciousness, belonging properly to touch, and faint suggestions of previous tactile and muscular experiences, blend with most of our perceptive knowledge of things through our eyes. On the other hand, the translation of touch-experience into terms of sight, with respect to all three of the so-called dimensions of space, is a more con-

stant habit, a more imperative necessity. Various proofs of this might be added to those already given in the last chapter. For example, if we with the eyes closed, suffer our limbs or our entire body passively to be moved, and then attempt to perceive the position in which we are thus placed, the almost irresistible tendency is to imagine how we should "look" to ourselves, if we were only to open our eyes. Again, in moving about in a dark room with which, and its objects, we are familiar, we guide ourselves chiefly by memory of space-pictures in terms of sight; that is, we recall and imagine how the objects have already been *seen* to stand related. The prudent man, who is mindful of a possible fire in the night, does not put out the gas in the room of his hotel until he has impressed upon himself the visual relations of all the principal objects (furniture, gas-jet, windows, door, staircase, or fire-escape) to his position in bed.

The theory of those who push their "touch-philosophy" of perception to such an extreme is not more untenable than it is unnecessary. We know[1] that we do, by use of the eyes with their developed activity, become immediately aware of all the spatial properties and relations of bodies. And scientific study of visual development itself reveals the fact that the means of such perceptive knowledge are very abundant. Indeed, it is just this possession of delicately shaded local signs, connected with the complex nervous structure of the organ of vision, and its rapid and equally delicately shaded motor activity, which fits the field of vision to be pre-eminently the field which yields the richest harvest of space-intuitions.

§ 9. We seem to be prevented, however, from saying that stereoscopic vision is absolutely dependent, for its very existence, on two eyes in motion. A field of vision lighted by an electric flash, too briefly for any movement of the eyes, is still seen stereoscopically; and the same thing is true of the field seen with only one eye, whether at rest or in motion. In both these cases, however, much of the result is doubtless due to the influence of suggestion, operating to revive in consciousness the perceptive data which were originally due to the activity of both eyes in motion. One-eyed persons are still capable of stereoscopic vision; the possibilty of this must be ascribed to sensations of accommodation, in a measure, but chiefly to certain "secondary helps" which will be described later. In all cases, however, stereoscopic and perspective vision with one eye is comparatively obscure, imperfect, and inaccurate. And the question being, not so much how can some such vision arise in abnormal cases, but how does such vision actually reach its normal high development, we must answer by referring to the effect upon consciousness of the activity of two moving eyeballs, operating as one organ of vision.

§ 10. The wonderful influence of the two unlike images of every object seen in binocular vision, in producing stereoscopic and perspective vision of that object, can be made apparent in manifold ways. If the two retinas were exactly symmetrical, if the physiological center of each were its true mathematical center, and if they both stood in precisely the same relation to

[1] Here we agree with Professor James as against Lipps and others, who maintain that perception of distance by the eye is "logically impossible." "No arguments in the world can prove a feeling which actually exists to be impossible." (The Principles of Psychology, I., p. 221, note.) When, however, James appeals to such "feeling" to decide a scientific question concerning the conditions and order of development, the appeal loses all scientific value.

the object (as they would, for example, when superimposed), then for every point in the object the corresponding point of one retina would be identical with the corresponding point in the other retina. Neither of these three conditions, however, is fulfilled. What takes place is as follows: certain points in the two retinas become accustomed to act together; the two images on these two points correspond sufficiently to be seen as a single image; the points (physiologically speaking) "cover" each other, and are referred to one and the same point in the object. Psychologically speaking, this means that the sensation-complexes called out by stimulating simultaneously certain two areas of the two retinas, whether in motion or at rest (and so as sensations of motion or sensations of position), are not discriminated; they are therefore not differently localized in consciousness.

Now, every visual object may of course be regarded as a system of points with a system of minute retinal images corresponding to them. When the system of minute retinal images of any object, which is formed on one retina, corresponds sufficiently nearly with the system formed on the other retina, that object is seen single and solid. But when these two systems do not so correspond, the object may be seen double. In the well-known experiment when we hold a finger up against the sky, and look at the sky beyond it, we see two transparent images of a finger instead of one solid finger. By mechanical pressure on one eyeball, or by an act of will, we may "uncouple" the images of any object; in which case it at once becomes double and loses its solidity. We can even slip one set of images of an entire section of some regular small pattern (as of carpet, or wall-paper, or wire-grating) by its proper "double," and then unite it with the double of another section into a solid object.

Moreover, it is obvious that the relations of the two images of any object cannot remain unchanged when the eyes move out of their primary position. In any other position than the primary one, only a few of the points of the object can correspond, on the two retinas, sufficiently to be customarily seen as single. If the other points were not relatively overlooked or interpreted in view of knowledge previously acquired, then the greater part of every object would be seen double. *The fact that double perception does not ordinarily take place, shows that all vision involves the selection and emphasis of some sensation-elements; the relative disregard or exclusion of other sensation-data; and the interpretation of the whole in terms of previous experience as determined by habit, practice, interest in the nature of the object, expectation, etc.*

§ 11. Binocular movement of the eyes may be (1) parallel, where they turn equally in the same direction; or (2) converging, where they rotate on the axes in opposite directions. Now, since divergence of the eyes is ordinarily impossible, there are three conjunctions of movement possible under different circumstances; these are right and left together, up and down together, or converging symmetrically or asymmetrically. These movements result in imparting a great variety of "local coloring," in the form of sensations of motion, of strain, and of position, to the space-consciousness when both eyes are used.[1] Constant changes of accommodation, and coupling and uncoupling of the double images, accompany this motor activity.

[1] The sum of all those points of any object which are seen single while the point of regard remains unchanged, is called the "horopter." A great amount of experiment, calculation, and dis-

That stereoscopic and perspective vision actually results from such *activity*, with all the wealth of "data" which it affords, we have abundant experimental proof. In our ordinary vision of objects of any size, we may readily become conscious of the fact that we are actually engaged in sweeping over the field of vision with a moving point of regard. Even when we suppose ourselves to be looking at a single point, with a perfectly fixed regard, we are really making rapid excursions in one direction and another, around this point. Now, since the right eye always sees the object a little further around on its right side, and the left eye on its left side, every small portion of a solid object (provided it lies a little way out of the point of regard) consists of two sets of minute curves that are partial images of its lines, and are different for each eye. The act of perception consists, in part, in distinguishing, uniting, interpreting, with a moving organ of vision, these systems of partial images.

How marvellous is the effect of uniting two such systems of lines in producing stereoscopic vision, the use of the stereoscope clearly shows. By its aid two systems of lines on a flat surface which, when uncombined, suggest solidity and perspective only somewhat doubtfully, become immediately endowed with perspicuous spatial properties and relations. All forms of objects clearly perceived in these dimensions—spheres, cubes, indescribably complex geometrical solids—are created by the eyes instantly, in this way. Thus we can be made to look into a funnel, or to perceive its small end turned toward us, or to behold starting into reality lenses convex, concave, and concavo-convex. By uniting a right-eyed image of some cube in outline, which is white, with a left-eyed image of the same cube in black, we can gaze into the transparent depths of a crystal, whose size and shape the artist has determined at will. For, in perfecting the sketchy "sensation-stuff" for perspective vision, the artist has only done in a simple way, what nature has constantly done, in more complex forms, with all things visual. *In either case, it is not merely sensing, but also ideating, discriminating mental life, which synthetically constructs the object of perception.*

§ 12. In all visual perception of the size and distance of objects with two moving eyes, the influence of both retinal signs and muscular sensations must therefore be admitted. The particular degree of acumen which such perception can attain varies greatly, according to the different positions of the eyes and of the object, the amount of light, practice, expectation, interest, etc. Different experimenters have found the proportional difference, which was "the least observable for them," varying under different circumstances from $\frac{1}{17}$ to $\frac{1}{37}$, and even more. Points vertically distant 20 mm. are ordinarily estimated as equally far away with those 25 mm. in the horizontal direction. Helmholtz found that, under the most favorable circumstances, a distance corresponding to a variation of 0.0044 mm. in the position of the *ret-*

cussion, has been directed toward determining the exact nature of the horopter. It has been found to be a line, a plane, a circle, a series of disconnected points. And no wonder. For *the horopter is never an optical, mathematical, or purely physiological affair; it is always and only a psychological affair.* It therefore differs for different individuals, and for the same individual under different conditions of habit, interest, etc. In other words, there are as many horopters as there are psychologically different individuals, as respects structure, function, and actual practice in discrimination, etc. (See however, Meissner, Beiträge zur Physiologie d. Sehorgans; and Archives des Sciences, III., p. 160. Le Conte, Sight, p. 204. Mrs. Ladd-Franklin, Am. Journal of Psychology, November, 1887.

inal image could be detected; Weber, on the other hand, that the *muscular sense* of the eye could recognize the displacement of the most sensitive spot of the retina by not more than $\frac{1}{521}$ of a Parisian line. With power to combine these two so nicely discriminable sets of data, the extraordinary space-intuiting faculty of vision is developed.

Besides the foregoing "data" of the more primary order, others of a more Secondary Nature must be considered. When the amount of influence allowed to the latter becomes prominent, and especially if doubt and delay accompany the perceptive act, the vision is often said to be a matter of "judgment" rather than of immediate perception. But "intellection," as discriminating consciousness, exercising a certain psychological judgment, has been seen to be necessary for all development of perception. That apparent immediate awareness of the spatial properties and relations of things which is due to their changing aspects, is largely accomplished by use of these secondary helps. The greater necessity for such helps, in our perception of remote objects by vision, is due to the fact that all the other data—muscular and tactual sensations of accommodation and convergence, and even difference of relations between the images of the two retinas—are here relatively weak. It is by these helps that the field of vision acquires that varied artistic quality which belongs to it; the objects in it become parts of a picture, and the whole is capable of being perceived as a rich, pictorial scene. It is by appeal to these secondary helps, in large measure, that various arts, such as painting, frescoing, and even, in a more limited way, etching and engraving, are enabled to represent the world of stereoscopic and perspective vision. Thus the life of vision becomes, not simply one of a practical sort, but also a life of beauty and of joy in beauty. Sight is the one sense which is both intellectual and æsthetical in the highest degree. On the one side its rival is touch, which is, however, relatively lacking in all power to give refined and sustained enjoyment; on the other is hearing, which, since music and language answer to it, is capable of high æsthetical satisfaction, but is relatively incapable of giving a perceptive acquaintance with the world of objects.

§ 13. Among the more obvious secondary helps to stereoscopic and perspective vision are the following:

(1) The *course of the limiting lines* of the object, which determine its distance and form as lying in the third dimension. Here the bottom lines of the distant object are very important; if they are covered or confused, its distance, size, and shape become uncertain to the eye. Lines that cover other lines are, of course, seen nearer; to be behind something else, and to be further away, is one and the same. Hence, when the outlines of any ob-

ject admit of more than one interpretation, the whole spatial structure of the object may be changed at will, or according to the way in which it catches the eye and fixates the original point of regard. Thus, the well-known example is explained of the outline figure which can be perceived as a staircase, either when seen as an ascending flight of steps or as looked at from underneath. So the same outline may be perceived, sometimes as convex and sometimes as concave, etc. [It is instructive in these cases to notice how the character of the perception changes—somewhat rhythmically—in dependence on the *motifs* as determined by the point of the object fixated, by the change of the attention and of the point of regard, etc.]

(2) *Mathematical perspective*, or the size of the angle of vision which is covered by near and far objects, respectively, is another important secondary help. In this way objects of known size are seen at the distance necessary to give them their apparent size. The nearer together the rails of the parallel track appear, the more distant they appear. In general, objects covering a large visual angle appear large, and those having a small visual angle appear small. But the influence of this principle is greatly limited. If the table, when looked at along its length, appeared to us under the influence chiefly of mathematical perspective, it would have to seem either far narrower or far more distant than it does. In general, the apparent size of objects does not decrease nearly as rapidly as their visual angles do.[1]

(3) "*Atmosphere*," and (4) the *size* and the *direction of the shadows* influence our stereoscopic and perspective vision. Things are seen nearer in a clear atmosphere, more distant in an atmosphere less clear. Painters pleasantly deceive us in this way, by use of aërial perspective, into perceiving their mountains far off and yet huge; and travellers in Colorado are unpleasantly deceived in their perception of the distance of the mountain's side on which they purpose a luncheon within a few hours from starting their climb. By arranging lights and shadows the spatial properties and relations of objects can be changed in a startling way. Intaglios can be converted into medallions or bas-reliefs, and the reverse. A medallion placed near a window, but shielded from its direct light, and lighted from the other side by reflection from a mirror, has its relief reversed. We all know how far off, and changed every way, the objects of the landscape begin to look when the shadows "begin to lengthen." (5) But *environment* and *comparative vision* are often of predominating influence. It is useless for us to insist to ourselves upon our judgment that the actor who comes down the mountain's side as a giant, and dwindles so as to look almost dwarfish when he approaches the front of the stage, cannot really be as he appears; we see him as he *is to sight*, in the changing environment; he can be seen no smaller, as long as he covers so much of such a distant mountain, etc.

The considerations just offered bring us again face to face with the truth that it is not in sensations alone that developed visual perception consists. *Our ideas, feelings, and volitions take part in determining how we shall see the spatial qualities and rela-*

[1] See Martius: Philosoph. Studien, v., Heft 4, p. 601 f.

tions of any object. In the very earliest processes concerned in the development of space-intuitions by the eye, ideating, affective, and conative factors are always present. Or—to say the same truth in more popular phrase—within given limits, we see what we think or imagine ought to be seen; what we are expecting, desiring, or fearing to see; and what we by an act of will determine to see. This truth, in the more obvious forms of its illustration, is virtually acknowledged by every intelligent observer of human conduct; it is consecrated by the structure and usages of language, by the experience of men in courts of law, by books of narrative, by common conversation, and in all forms of artistic endeavor. The same principle belongs to all perceptions—but pre-eminently to vision; because developed vision is the pre-eminent form of perception. Vision, therefore, illustrates more clearly and more variously than any other sense all the psychological principles of perceptive activity in general. We all know that he who is bidden to hear a certain sound, to search his bodily surfaces or internal organs for a certain symptom, to taste and find a certain flavor or a certain smell, or to look and see a certain sight, is thus rendered far likelier actnally to perceive what he is induced to seek. In highly wrought states of feeling and imagination, we hesitate about trusting the most vivid deliverances of the senses as corresponding to objective reality. The motto applies to visnal perception as well as to internal vision: "None are so blind as those who will not see."

That which is popularly recognized in these inaccurate ways as distinctive of certain acts of perceptive knowledge—namely, that its immediate awareness is not uninfluenced by imagination, memory, feeling, and will—the scientific study of its development illustrates as belonging, in scores of delicate, unrecognized ways, to all visual perception. Indeed, one of the essential results of this development consists in the relative increase of ideation and intellection, as compared with the purely sensational elements. As one learns to "mind" things visual, one's vision becomes more "mindful." The attention of psychologists is now engaged in investigating the amazing power of so-called suggestion to induce or compel definite perceptions in certain subjects of the hypnotic state. Various forms of mental alienation also are found to be most intimately connected with corresponding hallucinations of sense. Disorded imagination and disordered sensibility, whether the disorder be induced by the word of the experimenter or by cerebral disease, alike result in temporary or permanent change in the character of the patient's perceptions. If the disorder express itself chiefly in

changes of the perception of touch, then the consciousness of personality may be affected; but if the changes be chiefly in the realm of sight, then the objective world is likely to become an altered reality. In many cases the only way to reach the hallucination seems to lie through the patient's will. In the wider meaning of that much-abused word, all visual perception, true or false, our daily sights of the most practical and ordinary kind, as well as the wildest hallucinations of the hypnotic dreamer or of the inmate of the madhouse—involve "suggestion." *Without suggestion (brought about through the effect of the sensations in stirring up the ideas, as we may figuratively say) no perception can take place.*

§ 14. On the one hand, within certain limits *we see what we imagine* or know to be true of the spatial properties and relations of visual objects. On the other hand, we are not infrequently compelled to see (that is, by filling out the sense-data with representative images) what we know (that is, infer on grounds lying outside of the perceived object itself) cannot be true. It has already been shown how the visual character of some objects depends upon the way in which imagination, starting from some one of several possible groups of sense-data, fills in the details. In rather rapid vision, even of not very complex objects, different persons see different things;—and this, not only because they seize by attention different points of view, but also because the excited sensations themselves arouse and fuse immediately with different mental images. Here the physiological principle involves the extension of the cerebral excitement over a variety of previously associated areas and tracts of the organ. The psychological principle is that just stated—namely, all perception is the resultant of mental suggestion—a matter of the reproduction of associated ideation-processes. In cases where the sensuous data do not promptly and strongly suggest some definite association of ideas, a struggle between two possible interpretations may take place. In such cases, for an instant, we cannot "imagine" what we ought to see. At other times the object constructed in the first instant may be differently reconstructed later, as the analytic and synthetic activity of the eye is further carried on. In such cases, we find that what we first "imagined" we saw changes quickly into what we now "know" we see. The use of optical instruments which furnish bewildering sense-data (such as the *pseudoscope*, *telestereoscope*, etc.) causes an inability to imagine what we ought to see. Thus the spatial properties and relations of visual objects may lose their fixed value; because the mind cannot definitely fill in the sensuous data with the correct representative images. We then only partially, and in a vacillating and amazed way, perceive the object.

In the suggested perceptions of hypnotic subjects the influence of ideation, and its relation to the peripherally excited sensation-complexes, are shown in a very instructive way. Such subjects seize on any sensuous data in the field of vision, and employ them as a nucleus about which to gather the suggested ideas. Thus a visual object possessed of such reality as to cover all objects behind it so that they cannot be seen, may be con-

structed out of exceedingly meagre sensuous material. The sensation-stuff of such an object is indeed meagre; but nevertheless it sometimes exerts a controlling influence over the perception. Thus Binet[1] tells of a hypnotic patient who, having had suggested the hallucination of a portrait to be projected on a sheet of paper on which a hat had been drawn, perceived the suggested portrait wearing the hat which had really been drawn. The same patient, however, could not perceive an animal designed on a sheet where the hallucination of a man was to be projected. Thus, also, a suggested female figure, on a ground where a battle scene had been sketched, was perceived with the "epaulets" of an officer converted into her "*monticule*." A man seated in a chair being suggested, the hallucination was perceived with portions of a bird, which had been drawn on the back ground, "synthesized" with it as the required chair.

It is scarcely necessary to do more than to refer to the instructive fact that every form of pictorial art operates to induce the desired perception, by affording data of sense which suggest the revival and fusion with such data of familiar representative images. Art always issues a call to perception through imagination. And when surrounding sensuous impressions, if left to themselves, would operate to bind and hinder the imagination, we withdraw attention from them, or we cut them off by physical means (as when we look at a painting through a tube) from their otherwise legitimate influence.

§ 15. *The effect of feeling*, in its various forms, *upon visual perception* is both direct and indirect. Its indirect effect is attained largely through the relation which interest sustains to attention. Those sensuous data of an object which, for any reason, excite an interest—other things being at all equal—attract attention to themselves. And, indeed, we can scarcely attend to any visual object sufficiently to start an inchoate perception of its more obvious spatial properties and relations without having some form of interest awakened. Now, then, if we proceed to carry out further the perceptive process, and thus to develop a clear and detailed perception of the object, these particular sensuous data are likely to be determinative of the activities of ideation which are evoked to fuse with them. Thus, as we well know, different persons, with a different interest in the same object, will perceive it differently; this is because the more prominent points of regard, and the order of the wandering of the point of regard, and so the sensation-complexes induced, and so the mental images suggested, are all determined by the effect of interest on attention. Hence the difficulty of getting uninterested and untrained observers to perceive, even in the most rudimentary sensuous way, certain aspects of an object; they cannot complete perception because the sensuous data *suggest* to them nothing connected with past visual experience.

But the influence of feeling upon perception is also more direct. Perception, under the pressure of intense feeling is ordinarily more hurried; it is therefore less a matter of clearly discriminated sensation-complexes and more a matter of suggested ideas which fuse with the relatively meagre sensuous factors. The character of the suggested ideas itself depends upon the character of the feeling with which the perceptive act is accomplished. Hence—as has already been said—we tend to perceive what we expect to perceive,

[1] Revue Philosophique, 1890, ii., p. 142 f.

whether with a feeling of pleasurable anticipation, or of dread, or of anger, etc. The passenger, while waiting at a railway station, perceives nearly every sound as the noise of the expected train; the angry man is almost sure to hear the expected insulting word from his enemy; the lover does not fail to be "immediately aware" of that which he desires or dreads in the voice and gesture of his mistress. In spite of the relatively cool and intellectual nature of vision, feeling determines largely what ideas shall be so suggested as to fuse with the visual sensations and thus to constitute the character of the visual perception as such and no other. The objective and purely sensuous resemblance of an approaching face need not be great in order to insure its being perceived as an expected friend. Every inquirer into the origin of visions of ghosts and of "materialized" spirits knows how scanty a sensuous framework is necessary when feeling spurs imagination to construct the filling-in of the framework. And often, when by reasoning we have compelled ourselves to revise our perception and to look again in cooler blood, we can no longer perceive in the object even a remote resemblance to that at sight of which our blood was, but a moment ago, near curdling.

§ 16. Through *selective attention does conative impulse*, especially when it develops into intelligent volition, greatly *influence visual perception*. By an act of will the microscopist can exclude the influence of images formed upon one of his retinas and perceive only those objects that are constructed by activity of the other eye. It would seem that, in many cases, the fixation of attention alone can render the object clearer, and so in a secondary way change its location and bring it apparently nearer to the eye without change of focus or convergence. By act of will, under certain circumstances, the double images can be either perceived or not perceived. Where a conflict of colors or of outlines arises in the effort to unite two sets of images stereoscopically, it is sometimes possible to decide the conflict by a volition. Thus, if a card be prepared with two right-hand images of blue and two left-hand images of red, and then the four stereoscopically united, in some cases the volition of the perceiver decides which color shall be perceived; or whether the two shall mix in a binocular image of reddish-blue or of violet.[1]

In all construction of the outlines and relative position of a visual object with a moving point of regard, the part which conation takes in perception is more obvious. As the primary forms of conation, or of forced and "unimotived" impulse, are succeeded by intelligent and selective acts of volition, the part of so-called "will" in the perceptive process becomes increasingly prominent. We have seen that, in perceptions of touch, sensations of resistance, and feelings of effort furnish, as it were, the very kernel of our immediate awareness of material bodies (comp. p. 340 f.). This is due, not solely to the abrupt and involuntary limitation of our sensations of movement through space, when we come into contact with an external body, but also to the active effort which we make to overcome resistance.[2] Now it is the relative lack of these sensations and feelings in their most vivid form, and of the connected "pleasure-pains," which makes visual objects in general lacking in tangible, irresistible reality. But even here the lack is not complete. When movements of the eyes are made with tired or lamed muscles,

[1] Compare Hering: Physiolog. Optik, in Hermann's Handb. d. Physiologie III., 1, p. 591 f.
[2] Compare Beaunis: Les Sensations internes, p. 122.

the size of the perceived object is increased. When the function of one of the muscles (for example, the *externus rectus*) is impaired, objects seen by the eye moving in its shortened circuit are often located where they would have been if the same intensity of the sensation of resistance had been necessary to bring them to this position with a normal function of the muscles. Thus a patient with paralysis which prevents turning the eye more than 20°, will locate an object actually lying only 20° from the median plane much further to one side. As to the feeling of self-activity (or of effort centrally initiated) bearing any part in the perception of a visual body, there is ground for dispute; and the question is difficult to settle on purely experimental grounds, so delicate and changeable are these factors in all our experience with the eyes. All our previous investigations would lead us to suppose, however, that in all sensations of motion with the eye, conative consciousness bears at least an obscure part; and hence that the complete sensations of position involve traces of influence from the inhibited impulses of will.[1] For the eye, as for the skin, muscles, and joints, the statement of Naville is true: "*Will is the condition of our idea of a body.*"

In a yet more general and impressive way is it true that our will largely determines our perception. It is the "purpose" of the man, especially when such purpose has become organized into habitual forms of attention and motor activity, which limits or expands, to a large extent, every field of vision. Thus, as Schopenhauer says: "The traveller in anxiety and haste will see the Rhine and its banks only as a line, and the bridges over it only as lines cutting it. In the mind of the man who is filled with his own aims the whole world only appears as does a beautiful landscape on the meagre plan of a battle-field."

Every Act of Visual Perception may therefore be considered as a Problem, the solution of which is attained (with a greater or less degree of speed, amounting ordinarily to a practical instantaneousness) *on the basis of certain data, by a constructive and interpretative mental activity that has been developed through experience.* This view accords with all our language, with the facts of adult self-consciousness, and with all the scientific information which study and experiment can gather. It is not without significance that we use the word "perception" to indicate all kinds of "immediate awareness" of objects as having a meaning, as embodying ideas to our minds. Whatever we can bring within the unifying grasp of interpretative consciousness, that we may be said "to perceive." Undoubtedly our ordinary adult consciousness, when perceiving objects by the eye, favors the view that a certain content is being passively impressed upon consciousness; and that memory, imagination, feeling, and will, have little or nothing to do with the result. As one writer has said: "The external thing is our creation, but we become its slaves. The product of our ideation becomes the cause of the ideating

[1] To this extent we are inclined to modify the view taken in the Elements of Physiological Psychology, and recognise the value of the evidence brought forward by Wundt, Loeb, and others.

process itself." On the other hand, we can more or less distinctly bring out in adult consciousness the active side of mental life in constructing the object of visual sense. We can even "hark back" in consciousness and discover what sensations or ideas have influenced us to perceive them in this particular rather than some other way. That visual perception *is* a problem admitting and requiring solution in a very variable way, is a thesis which all our past investigations tend to establish.

A Summary of the Principles which control each particular act of perception with the eye, considered as the "Solution of a Problem," includes the following:

(1) The color of the visual object in binocular vision depends upon the combined action of the two retinal images, each of which has its color determined by all the influences that co-operate in the production of the various qualities of light- and color-sensations (see pp. 122 ff.). Ordinarily these sensuous factors are so nearly alike for every corresponding part of the two retinas that they fuse perfectly, and the object is seen as one colored and extended thing. If, however—as sometimes happens—the two color masses are so unlike as not to fuse, color-wise, then either (*a*) the more intense of the two triumphs and suppresses the weaker; or (*b*) some combination into a different color takes place according to the laws regulating color quality; or (*c*), in rare cases memory and imagination operate to reproduce what experience suggests ought to be, or even an act of will directing attention may decide between the two.

(2) The size, shape, and locality of the visual object, whether regarded as a whole with reference to its parts or as one object among other objects (with background, environment, etc.), depends chiefly (*a*) upon the variations in the intensity and local coloring of the sensations of motion and the sensations of position which are evoked by moving the point of regard rapidly over its outline, its surfaces, and its surroundings. But (*b*) all that we intend by sensations of motion, to some extent, and all that we intend by sensations of position, to a very large extent, involves "suggestion" of traces of past experience in the form of revived images of motor-consciousness. But (*c*) the diversifying of the local signs of the retina, which such movement of the point of regard accomplishes, co-operates with the changes in the muscular and tactual sensations to complete the perception of the extension of the object. (*d*) The influence of environment, as eliciting the relating activity of mind, the more purely intellectual factor, is very great in all cases of measuring and constructing the visual object.

(3) In visual perception of the spatial properties and relations of near objects, some influence must be allowed from (*a*) accommodation as an aid in solving the complex problem. But such perception is largely due to (*b*) the influence of the two retinal images, of their relations to each other, of the suggestions arising from each, and to the possibility of varying these relations by motion of the two eyes according to the laws of the movement of each, respectively.

(4) In visual perception of the spatial properties and relations of remote objects the various secondary helps become more influential in solving an increasingly complex problem. Among such secondary helps that one will lead in bringing about the solution which is most impressive, either (*a*) on account of its sensuous intensity; or (*b*) on account of the tenacity and breadth of its suggestiveness; or (*c*) on account of some emotional or other ground of preference.

(5) In all visual perception where sensations of motion, or revived and suggested images of such sensations, are as much as possible excluded, the solution of the problem of vision becomes more vacillating and uncertain. The truth of this is particularly seen when we remember that even attention itself seems to involve some modification of motor consciousness; attention itself affords evidence of some inchoate attempt to move, with at least a dim feeling of effort and sensations of fusion, strain, etc. On the other hand, the perception of color-masses with motionless organs, and with attention as much as possible not fixated, is so vague and "unobjective" as scarcely to merit the name perception. Whatever immediate awareness of localized and projected color-masses, bearing spatial relations to each other, seems to come through inattentive and motionless visual organs may be assumed to be due to the effect of sensation-complexes, discriminable by their local signs of the retina, suggesting the images of sensations of motion and position with which they have been, by frequent repetition, habitually fused. Actual fixation of attention and movement of the point of regard seems necessary to convert these related color-masses into a clearly perceived object, or group of objects.

(6) In all forms of the solution of the problem of visual perception—in (2)–(5) as well as in (1)—not only the purely sensuous factors of a peripheral origin, but also the so-called faculties of memory, imagination, feeling, and volition, bear an important part. If the condition of the organism and of "apperceiving" consciousness is, so to speak, normal, and if the sensations arising from purely peripheral excitement of the organ are suffi-

ciently intense and multiform; then the percipient will construct the visual object with the same color and spatial properties and relations as those which are attributed to the same object by other percipients. In other words, under ordinary circumstances the man of normal organs will see things as others see them. But with altered conditions of the organism, or of apperceiving consciousness, or when the sensuous factors are few and weak; then perception becomes more a matter of individual peculiarities. That is to say, under such circumstances, what every man sees will depend upon what sort of a percipient he is—upon *his* memory, imagination, feeling, or will. *For every case of perception affords a new problem to consciousness; and precisely how that particular problem will be solved depends upon a great variety of considerations.* In this meaning of the words—Every man must see with his own eyes; no man has the gift always to see things as others see them.

Finally, the foregoing theory offers the only satisfactory basis for an account of the origin and character of the different Illusions and Hallucinations of Perception. The process of perception proceeds according to the same principles, whether the product of perception be correct or illusory and false. To maintain, then—as is so often done—that it is not the senses but the intellect which deceives us, implies a complete misunderstanding both of the facts and of the correct theory. Except as intellect enters into the process, the senses, so called, give us no presentation of sense, no "object," whether true or false. For all that work of the senses which ends in perception involves interpretation. It would be more correct, then, to say with Lotze: "The whole of our apprehension of the world by the senses is one great and prolonged deception," than to say with Professor James that the fallacy "is not fallacy of the senses proper." Neither is Binet right when he affirms that what is fallaciously inferred is "always an object of some other sense than the 'this.'" How can such statements apply, for example, to the case when I cover a red square with a square of white tissue-paper and then see it green; or when I lay two cards, red and green, one a little in advance of the other upon a table, and then by superimposing the reflected image of one upon the other, see the fusion as a grayish card. The general truth is, we repeat: *All perception is interpretation; and from partial or mistaken interpretation all degrees and kinds of illusions and hallucinations result.* Nor can any fixed line be drawn between illusions and hallucinations any more than between the different degrees of both. For if we define an hallucination as

a "false perception resulting from no objective stimulus at all," we still find various degrees of vividness and objective reality imparted to the object with a minimum of traceable peripheral stimulus; and it is ordinarily quite impossible to be sure that no peripheral stimulus is involved in what appear to be the purest forms of hallucination. If further, we distinguish "objective stimulus" from peripheral stimulus, then we must say of the former that it has absolutely nothing to do with perception, whether true, illusory, or hallucinatory. Between normal perception and illusion, between illusion and the most incorrigible hallucination, there is no break in principle. Hence the value of all such cases, so far as we are able to explain them, in the establishing of a correct theory of the nature of perception in general. All the foregoing six principles admit of almost indefinite illustration by different cases of illusion and hallucination—but especially of the sense of sight.

§ 17. Our perception of the color of visual objects, especially in cases of certain illusory effects when the mind is called upon to combine stereoscopically two differently colored images, is sometimes difficult to explain satisfactorily. The explanation of certain phenomena would seem to require reference to obscure processes in the cerebral centers, where the sensuous impressions from the two eyes come together and "struggle" or "fuse." According to some authorities, if a white stripe be placed upon a black surface and divided into two images, the right image formed by looking through blue glass and the left by looking through gray glass—then the right image will be seen blue, but the left will be seen yellow. The experiment with cards just referred to is said to have been performed with hypnotic hallucinations. If the contours of the images of two differently colored objects run on the retina so as to cross only at one place, then sometimes one color and sometimes the other will prevail at the place of crossing. This is called the "strife of contours." The peculiar perception of luminosity is regularly due to a rapid alternation between the effect of the black images of one eye's field and the white images of the corresponding field of the other eye. It is of the nature of an illusion of sense; it may be produced by stereoscopic combination of a white with a black surface—the two having a similar contour. When two series of outlines, properly arranged,—one series with white and the other with black surfaces—are stereoscopically seen, we have the illusion of a transparent solid (see p. 360). In all these and similar cases, the physiological explanation, like that for the mixture of sour and sweet tastes in the lemonade, is cerebral; that is, the relations of conflict and triumph, or of fusion, are established in the brain. The psychological principles which control the solution of such problems in the perception of color are those already enunciated in (1); either as (*a*) or (*b*) or (*c*) (p. 368).

§ 18. (a) Distance, whether known by previous experience or assumed; (b) apparent magnitude, as determined by the size of the visual angle which the retinal images cover; and (c) real magnitude, or the known size of the

object as related to certain fixed standards of measurement based on generalizations of both sight and touch—are all connected as factors entering into problems of the perception of the size, shape, and locality of visual objects. But the least observable difference between apparent magnitude and real magnitude has a different absolute value for different distances and different real magnitudes. It increases with the distance somewhat constantly, but very slowly. It increases with the real magnitude, but not always in a perfectly calculable way. Hence arise many of the illusions of sense. The size, for example, of the sun or moon is perceived very differently by different persons, according to where these bodies are located in distance; to some these bodies are no larger than an orange, to others larger than a cart-wheel. The height of a building or of distant mountains is perceived illusorily in dependence upon our assumption that the figure standing on its top is a man, when it really is a child, or a child when it really is a man, etc. When we are compelled to locate the setting sun or rising moon far back of the distant trees, its perceived size may be greatly enlarged.

Since intensity of sensation is a measure of extensity of superficies or of distance, many illusions arise from misinterpretation of the import of felt intensity. Reference has already been made (p. 366 f.) to the false localization due to tired or lamed muscles of the eye. Illusions like the following owe their origin—in part, at least—to this principle. Vertical distances are usually perceived as larger than equal horizontal distances. Thus, when trying to draw a cross with equal limbs we are apt to get the vertical dimensions too small. Exactly equal squares appear higher than their breadth. By inverting the forms S and 8 the difference in the two halves, which has been minimized in their ordinary positions, now becomes magnified. When the distance between two points becomes measureable by a line which the eye sweeps between them, this distance is perceived larger. Squares intersected with lines appear enlarged in the direction in which they are repeatedly intersected; right angles that are divided into a number of smaller angles are perceived larger than such angles enclosing vacant space. Combining this principle with the tendency to perceive all lines as extending in the direction in which we sweep them with the greatest ease with continuity of movement, we account for other very startling optical illusions. Among these are the illusions produced by drawing series of lines so as to meet, or to cross, at either acute or obtuse angles, a pair of parallel lines.[1]

Another interesting class of illusions seems to depend mainly upon the principle that, in measuring magnitudes and distances with the eye, our standard is regularly adjusted to the environment. Thus the perceived size of any object is relative to the known or assumed size of its background and its surroundings. If attention be directed upon the objects to be perceived "by themselves"—as it were—the environment is "suggested;" and then the principle is: "The more contracted the suggested environment of the space-dimension in question, the smaller will the object appear; and *vice versa*."[2] Hence the limbs of an obtuse angle are perceived longer than

[1] Compare on this subject the author's Elements of Physiological Psychology, p. 456 f. Wundt: Physiolog. Psychologie. II., p. 194 f.; and James: The Principles of Psychology, II., p. 247.

[2] Compare an article by Müller-Lyer: Optische Urtheils-täuschungen. Du Bois-Reymond's Archiv, Supplement, 1889.

those of an acute angle of equal length. Again, if we draw a pair of obtuse angles and connect their apexes by a straight line, the line connecting the obtuse angles will be perceived longer than an equal line connecting two acute angles, provided the angles are directed *toward* the connecting line; but if they are directed *away from* the line then the reverse is true; and the contrast is strongest when both considerations are combined. [Here it seems probable that the tendency of the eye to sweep onward, unless checked, and to measure its sweep, is of great influence over the resulting perception.] Thus also the sides of a triangle seem smaller than the equal sides of a square; the sides of a square than the equal sides of a pentagon, hexagon, etc. Further; in perceiving the contours of somewhat complex figures, the different parts are perceived relative to each other. If then a section of the contour of any figure is left out, the whole contour may appear changed; and if the small side of one of two equal figures is placed opposite the large side of the other, the entire first figure is perceived smaller.

§ 19. The question is often raised as to how vision of a *single* object is explicable when it is performed with *two* eyes, each having its own system of retinal images, etc. It should by this time appear that such a question involves the most profound ignorance concerning the fundamental principles of the psychology of perception. For it is just this habitual fusion of the two systems of sensation-complexes, with their corresponding revived mental images, in which complete stereoscopic and perspective vision of all objects, as single, chiefly consists. And when illusions and hallucinations of this kind occur, and objects really single are seen double, or objects really double are seen single, the psychological data and the principles of mental activity are in no respects changed. On the contrary, *it is the acquired fidelity of consciousness to fact and to law which produces these illusions; since the object is always a mental construction, the solution by discriminating and interpretive consciousness of a problem proposed in terms of sensation and representative images.* When, then, the two systems of sensation-complexes are so different that the *motifs* (whether of memory and imagination, working on a basis of past experience, or even of volition) are inadequate to make them fuse, two objects rather than one *must be* perceived. This is, of course, the explanation of the instance taken from touch—as old as Aristotle. Cross two fingers and roll a pea or other small object between them; and it will appear double. Thus in the case of the eye, if the *indiciæ* requiring two objects differently localized are presented, and cannot be overcome, then two objects will be perceived. But here, as already shown, some variation of result is admissible, for which imagination and volition, rather than mere sensations, are responsible.

§ 20. No class of optical illusions is more instructive, as respects the theory of perception, than illusions of motion. The number of such illusions is legion. If the proper oscillations of the sensory impulses—from rolling eyeballs, swaying of the tiny currents in the semicircular canals, or more massive but not less obscure and unlocalizable sensations due to changes in the fluids and solids of the body—are produced, then the whole world of objects must be perceived as in movement. Hence the illusions which giddiness and whirling produce. Professor James alleges that in deaf mutes (whose semicircular canals must often be disorganized) "there very fre-

quently exists no susceptibility to giddiness or whirling." Optical vertigo, from cerebral disease or intoxication, produces these illusions. Similar illusions occur through the temporary continuance of the sensation-complexes, signifying movement, after the moving object is no longer in the field of vision; and this may result in the illusory perception of movement in the opposite direction. The diminished size of objects when seen from the windows of a rapidly moving train has been explained by Helmholtz,[1] as follows: In ordinary perception, when we are moving forward, all objects appear gliding backward; and the nearer they are, the more rapid is their flight. But in this case, the extraordinarily rapid flight is interpreted as significant of nearness. Now, again, the nearer an object is, with a given size of retinal image, the smaller is its size perceived to be. In this complex way, on the basis of a vast amount of experience, do we present ourselves, at once and irresistibly, with a field of objects of diminished size as seen from the windows of a swiftly moving train.

§ 21. It is customary to speak of the illusory character of those representations of things which Art furnishes to the eye; and even to complain of the senses for being "deceived" in so cheap and easy a fashion. There is a certain truth in this manner of speaking. The more important and fundamental truth for psychology is, however, of quite another sort. It is mathematical optics and mathematical perspective which, while it has an abstract and intellectual truthfulness, is to actual perceptive knowledge quite false and misleading. On the contrary, *it is art which presents to the eye the objects as they really are;* and hence all its pleasant and truthful illusions. *It is mathematics which is unreal and deceitful* when brought to the test of actual perception. For the mind, in ordinary perception, is an artist and not a mathematician; its optics and perspective are not mathematical but belong to the constructive realm of imagination, operating upon and interpreting sensuous data. *To perception, things are, not what they are figured out to be, but what they appear to be.* The instantaneous photograph of a running horse, for example, is a disagreeable travesty of what actually takes place when we perceive the horse in motion. This is just because the photograph leaves out so much of what recognition and imagination put into every perceptive reality. It is scarcely more like an actually perceived horse in motion than is the man seen, when by looking through a telescope we place him on his head with his legs going through a series of ungainly, jerky, and widely extended movements in space, like the actual man.

Nor is it with reference to the comparatively rare perception of art-objects that the value of suggestion and imagination is greatest. Without suggestion and imagination no perception of objects could be correct—outside of the fixated point of regard and its most immediate neighborhood. Without imagination, constructive and corrective, no symmetrical figures could be perceived; no solid visual objects could be seen; no field of vision could become a field of consciousness. For the paradox is true: if mental activity in the perception of objects were required to be mathematically correct, then no such thing as correct perception of objects could take place at all. Thus, instead of all objects in indirect vision being perceived distorted, as mathematical optics must consider them, they regularly appear in the place which

[1] Physiologische Optik (1st ed.), p. 365.

they would assume if their retinal images were transposed to the point of regard and to its surrounding points. And when the head and body move with the eyes, we have in ordinary circumstances so correct a knowledge of the value of the resulting muscular and tactual sensations (sensations of the position of the head and trunk) that we can still solve the problem of visual perception without great embarrassment, and with a fair amount of correctness. But here again, the illusions of sense which arise when we miscreckon the general relation of the field of vision to surrounding space only further illustrate the same psychological principles.

The foregoing brief account of the Development of the different classes of Perception by no means gives a full explanation of how we come to the knowledge of things—not even of their spatial properties and spatial relations. It could not do this, were it indefinitely extended in the same directions. In order to understand "knowledge" as of things, and "things" as known both by perception and by inference from perception, other important mental processes and aspects of mental processes must be taken into the account. We shall, therefore, return to this subject at a later stage in our discussion of the development of mental life.

[Besides the treatment given to visual perception in works discussing the general theory of perception—already referred to—the number of monographs dwelling wholly, or chiefly, on "vision" is very great. Among such monographs the following may be mentioned: Cornelius: Die Theorie des Sehens. Panum: Physiolog. Untersuchungen über d. Sehen mit zwei Augen. Vischer: Ueber d. optische Formgefühl. Nagel: Das Sehen mit zwei Augen; and Der Farbensinn. Ueberhorst: Die Entstehung d. Gesichtswahrnehmung. Böhmer: Sinneswahrnehmung. Stumpf: Raumvorstellungen. A. N. Volkmann: Untersuchungen im Gebiet d. Optik. T. K. Abbott: Sight and Touch. Le Conte: Sight. Aubert: Grundzüge d. physiolog. Optik; but, above all, Helmholtz: Physiolog. Optik (a new edition of which is slowly appearing). In English, the discussion has been general rather than minutely scientific, and, of course, connected usually with the attack or defense of Berkeley's Essay towards a New Theory of Vision. Of those who have taken part in this discussion during the last fifty years, the following names deserve special mention: Bailey, J. S. Mill, Bain, Spencer, Fraser, Sully, and Ward. For the most recent information, resort must be had to the later articles in magazines—far too numerous for our meagre bibliography to mention in detail.]

CHAPTER XVII.

MEMORY

From the primary reproductive process, with its general result of bringing into consciousness associated mental images, a number of so-called "faculties" have their development. The three faculties of memory, imagination, and thought, in so far as they are reproductive (and all *are* to a large extent, reproductive) have thus a common root in the fundamental life of representation, as that life has already been explained. It remains now to show how, by combination in different forms with the other developing processes of the same mental life, these three allied faculties are actually developed. That there can be no imagination without memory, and no thinking without remembering and imagining, is obvious enough. On the other hand, we undoubtedly seem to ourselves differently employed when we are trying to remember something, and then again to imagine how something looks about which we have heard. None the less sure are men generally that thinking differs in some marked respects from both remembering and imagining. To be sure, one might say with almost equal appropriateness, on trying to solve some theoretical or practical problem; I am trying to think, or I am trying to imagine, how this is, or would best be. And yet the more intelligent use of the word "thought" in preference to the word "imagination," seems to pledge us to the serious pursuit of our end according to logical laws or to forms corresponding with our experience of perceptive reality. Once more —and proceeding, as it were, in the reverse order of consideration —unless one imagines and thinks, one cannot remember, with a true and full recognition, any complex event of past experience.

Now as to what these three interrelated faculties have in common, enough has already been said. The common factor is the representative image, with its different degrees of intensity and life-likeness; the common processes are those of the reproduction, under the general laws of all reproduction, of the associated ideas. Hence all these three faculties are distinguished as *re*presentative; they are not faculties of presentative psychoses,

as are sense-perception and self-consciousness. That is to say they are not *mainly* so; for we have just seen that sense-perception itself involves memory and imagination, and even primary intellection. *Memory, imagination, thought, as predominatingly representative*, alike depend upon the fundamental faculty of ideation—in the wider meaning of the latter word. In this sense they *are different developments of one and the same form of mental life.*

It is by no means easy to tell what fixed characteristic differences separate these three representative faculties from one another. Indeed, separate exhibitions of any one of our faculties are not to be found in the actual life of adult consciousness. We must be content to show how, by combination with the higher developments of other equally fundamental processes, these different forms of reproductive mental life are themselves developed into the three faculties of memory, imagination, and thought. And here it must be noted that it is not purposeful volition which initiates the characteristic differences. The most elaborate acts of *voluntary* remembering are no more like acts of imagination or trains of thought than are the forced occurrences of memory-images. On the contrary, the more intelligent, purposeful, and well controlled one's memory is, the more are pure acts of imagination and thought excluded. Something similar is true of imagination and thought. The would-be artist or inventor cannot, of course, succeed without constantly exercising his faculties of memory and thought. But what he wishes especially to have happen to him is something beyond mere remembering and thinking; something which he is powerless to impart directly to imagination by willing, but which comes to imagination as its own peculiar quickening and uplift, only if he voluntarily excludes an excess of mere thinking and mere remembering. The case of the man who is "bent on thought" is not different. The more self-controlled and purposeful his thinking becomes, the less is it like mere remembering or imagining. It is not by addition of will, therefore, that the differences in these faculties are emphasized or immediately developed.

As a basis for the more detailed treatment of memory, imagination, and thought, the following brief statement of their differences is helpful: In brief, then, (1) "Memory" differs from imagination and thought with respect chiefly, to the characteristic of conscious "recognition." In memory, the representative object is *known as representative;* and this knowledge, as recognitive, developes almost *pari passu* with two cognate forms of consciousness. These are the consciousness of time and the

consciousness of self. For truly speaking, every object which is remembered, and not merely imagined or thought, is recognized as representative of a *past* presentative experience, and of *my* past experience. Without the development of the consciousness of time and the consciousness of self, no development of memory —in the full meaning of that word as genuine mental faculty—can therefore take place. In (2) "Imagination," on the other hand, just so far as the reproductive activity is imaginative, *recognition* (in the above-mentioned use of the word) *is suppressed.* The representative object may be, in fact, only the more or less exact reproduction of an actual presentative experience in my past; but if it is to be considered as an object of imagination rather than of memory, it must not be consciously known as such reproduction. In other words, the object of imagination appears in consciousness as "freed" from those bonds of recognized relation to my past which the object of memory always has. In connection with this characteristic difference, another most important and suggestive difference arises. All my memories, as such, are of what—as I am wont vaguely or more clearly to believe—really happened. "My past" can never be represented in any other way, whether we call the precise form of representation memory, imagination, or thought, than as consisting of real occurrences at some time presentatively known to me. I may, indeed, imagine or think it to have been different from what I distinctly remember it to have been. But doing this results in my presenting myself with a picture which, by its very nature, is put in contrast with the actuality of my past. If anything beyond the limits of the present field of consciousness attaches to itself the conviction or belief of reality, it is just this—namely, my past as given to me in fully developed recognitive memory. On the contrary, the objects of my imagination, whether this form of reproductive activity be the so-called "passive" or the so-called "active," do not have the same conviction or belief (resting on the ground that they are recognized as belonging to my past) attaching itself to them.

How (3) "Thought" is characteristically different from imagination cannot be satisfactorily explained in a few sentences. Its close resemblance to, and dependence upon, imagination is recognized in all our use of language. Indeed, much confusion has always arisen in psychological discussion on account of the very natural use of the word "idea" for both the concrete sensuous image and the concept or product of thought. On the other hand, as respects the "reality" of its objects—assumed, inferred, or somehow believed in—thought is more closely allied with,

and dependent upon, memory than upon imagination. The following three particulars, however, summarize those most important differences, which will be more fully explained later on: (*a*) In trains of thought, as distinguished from series of associated representative images, the individual factors, or "moments," of the train, are different. This difference may be summed up in an indefinite way by saying that the ideas which succeed each other, when we are distinctly *thinking* (not merely imagining) are more abstract, more "freed" from their concrete manifoldness, more schematic as it were (see p. 284 f.). This difference is indeed a matter of degrees, and no fixed line between the representative image and the concept which will stand the test of actual psychical life can be drawn. For that reason we cannot definitely say where imaging leaves off and thinking and conception begin. (*b*) The relations between the different contiguous factors in trains of thinking, when compared with series of associated ideas, are seen to have a different origin and character. Here the fundamental distinction seems to be that, whereas in mere imagination no consciousness of relation (whether of similarity, or difference, sequence, simultaneity, cause, etc.) is necessary, in thinking, such consciousness of relation is implied, either as actually accompanying the succession of psychoses or as due to previously formed habits of conscious activity in relating. In a preliminary way we may say that *thinking is a process of relating, together with an immediate awareness of the relation.* An examination of the character of the relations in which, by thinking, our psychoses are placed leads us to ascribe the result to the laws of a so-called faculty. This faculty we call "intellect." Intellect comprises that development of mental life which lays emphasis on those activities of assimilation, discrimination, etc., which we have already treated. Thinking, then, although a form of representative faculty, is also—more distinctively—a development of the relating consciousness of primary intellection. Hence, in thinking, the laws, or fundamental forms, under which the ideas become related, are the laws and forms of intellectual life. (*c*) Important modifications and acquisitions of motor consciousness are necessary in order to emphasize and develop the distinction between imagination and thinking. Here the intimate relation between *language* and thought must be taken into account. But language, so far as related to the thought of the thinker (in the most general use of the word) always consists of some form of motor consciousness. This is true whether the so-called "sign" be given in terms of the tongue and other vocal organs, or in terms of the hand (gestures,

etc.); and whether it be expressed so as to be intelligible to others, or be suppressed and yet employed as a support and guide to the thinker's own thought. In other words, as the mental images become more and more abstract, and the laws of their relation become more intellectual and more consciously determined, the necessity and importance of the language-sign becomes greater; and such sign consists in doing something with the motor organism and in experiencing the resulting modification of motor consciousness.

§ 1. The discussion whether memory is properly to be called a "faculty" or not, scarcely possesses the real importance which is customarily attached to it. If by the word "faculty" we intend an elementary mode or process of conscious mental life, then memory is not (but representative image-making *is*) a faculty. Then, however, perception, imagination, thought, emotion, desire, and will, are not faculties; for *these are all developments of complex resultants arising from the exercise of all the fundamental faculties*. Neither can retention,[1] considered as a state or activity of "the unconscious," be regarded as mental faculty; and the same thing is true of the merely psycho-physical and unconscious conditions of suggestion and the association of ideas. But the conscious (and especially the voluntary) revival of past presentations of sense, or states of self-consciousness, with the recognition of them—they really being, of course, always only my present psychoses—as representative of my past, is as truly the exercise of a faculty as is perception, thought, etc. That is to say, true memory is one of those complex activities of mental life which we always find developing as necessary to the very existence, in any elaborated and highly organized form, of truly *mental* life at all. Following a pardonable and indeed inevitable metaphysical instinct, we ascribe the fact that such form of mental life exists to an original power of the being (the mind) whose life we are considering. To express the matter naïvely—mind has the faculty, or power, to do what it actually does. But in all such cases it would be truer to the facts of psychological history to say: By exercise of the simple and fundamental faculties, the complex and acquired faculties of memory, perception, thought, etc., are developed. Whatever form of language we adopt we do not in that way either increase or diminish our knowledge in the least degree. Thus Ulrici[2] denies that recollection is a special power or faculty, but affirms that it is a property of consciousness; for the ideas do not simply move or disport themselves in the soul, but it is the soul which turns itself from the present to the past conditions, and so from one idea to another. Binet,[3] however, would reduce all the factors of recognitive and voluntary memory to associated brain-processes with a mere "epiphenomenon" of consciousness. But he, too, is forced to admit that consciousness of resemblance is something very different from the mere fact of the recurrence of

[1] On the impropriety of regarding memory (retentive) as a mental faculty, Dittes pertinently remarks: "Also sensations, opinions, psychical oppositions, as well as everything that develops from them, and, moreover, dispositions, traits of character, feelings and passions, virtues and vices, endure (are retained.")—Lehrbuch d. Psychologie, p. 50.

[2] Gott und der Mensch, I., 2, p. 210 f.

[3] La Psychologie du Raisonnement, p. 115 f.

resembling brain-states; and this being so, recognitive memory has to be brought under terms of *mental* faculty. Neither the spiritualistic psychologist nor the physiological psychologist, by affirmation or denial of the so-called faculty of memory, adds to or subtracts from either the data or the explanations of psychological theory. As for us, we shall continue to use the word faculty for any of the developed forms of mental life, in the meaning of the word which has already been sufficiently explained (compare p. 51).

It is customary to speak of three Stages of Memory; these three are Retention, Reproduction, and Recognition. Retention seems to be implied in the very fact that our present psychoses are representative at all of our past experience. Unless they were thus representative no memory could exist, and indeed the organization of the psychoses into what we have any right to call "experience" would be impossible. Reproduction, on the other hand, expresses the fact of the presence in consciousness of certain psychoses bearing this peculiar representative character. Such psychoses actually appear, or are produced — as we figuratively say—by the mind; but since they are recognized as representative, they are said *to be* reproduced; and since they occur in relations similar to those in which their originals may be remembered or inferred to have occurred, they are said to reproduce *each other;* and, again, since sometimes our volitions determine the fact and the order of their appearance, *we* may be said to reproduce them. But, as has already been said, the very essence of the developed faculty of *memory* is Recognition; and this involves the consciousness of the present psychoses as representative of my past, and so a reference to that *past* which is *my* past. Therefore the cognition of memory is properly called *re*cognition.

It is evident, however, that by no means all this threefold, or triple-stratified, activity actually takes place in every conscious process of memory. Indeed the most elaborate and deliberate acts of memory give no evidence of all this. The simple fundamental fact is that "we remember;" and that each memory is of some of our experiences rather than of others. Some of our experiences—presumably—we cannot remember or never have remembered. Every act of memory also takes place in some order within the general stream of consciousness; it is more or less distinctly and completely representative of some past experience; and it is distinguished by more or less of conscious recognition. These three terms, then—retention, reproduction, and recognition—really set forth, in different aspects, what it seems necessary to assume in order to explain satisfactorily the mysterious

and complex fact that we do find ourselves remembering in a self-conscious, recognitive way.

But here we must take notice of important differences with respect to the relation in which these three assumed processes stand to the undoubted fact of memory. For, let it not be forgotten, all we are sure of as psychological fact is—"I remember;" and this simply means that certain states of present consciousness have the peculiarity of bearing in themselves the *sui generis* claim to be a knowledge of past presentative states of my consciousness. This is to say over again that I cannot even conceive of the possibility of my remembering (as distinguished from imagining or thinking) anything which does not belong to my conscious past. It follows that *what is called "recognition" is the essential psychological peculiarity of memory as a developed and conscious mental activity.* And whether we can explain its origin and conditions, or not, makes no difference in the relation which this stage of memory bears to the completed act. The stage called recognition is *in* consciousness and purely *of* consciousness—all of it—and it is the one thing about the faculty of which we are perfectly certain. But the case is not precisely the same with the stage called reproduction. It is sometimes said that by reproduction we signify "the actual return of the image to consciousness;"[1] and to this statement there is no objection. But we do not have *memory* until the reproduced image is recognized.

Nor in fact does reproduction, as a factor of memory, take place in its completion before recognition is added, as it were. On the contrary, in memory recognitive reproduction is the distinguishing form of representative activity; for we may become conscious, in a measure, of the reproductive process; we can watch ourselves, while remembering, and notice how the ideas suggest each other in the stream of consciousness; we can voluntarily "hark back" upon our most recent memories, and, taking advantage of the laws of suggestive association, "round out" the revived images into a more complete recognitive act of memory. In this way do we quicken, purify, and enrich our mental pictures of the events belonging to our past conscious experience. This process of reproduction, then, is itself in a measure a process in consciousness. It is also, in part, a process belonging to the "fringes" or "borders" of consciousness, the dimly conscious or half-conscious mental life. In order to complete our explanation of so much of reproduction as belongs to conscious memory, and therefore stands within the field of

[1] See, for example, Baldwin: Handbook of Psychology, I., p. 151.

memory-knowledge, we may indeed choose to speak of "unconscious reproduction." But in doing this we are only drawing inferences, or making conjectures, as to the antecedent conditions of memory.

What is partially true of reproduction is absolutely true of retention. Properly speaking, scientific psychology can know nothing about retention as a stage, or factor, or state of memory. And strictly speaking, *retention* is not a word to be applied to any psychical act or process whatever, or however concerned in the undoubted fact—I remember. This statement is as true of all physiological theories of memory as it is true of those theories which rely upon the existence, and mutual influence of so-called unconscious ideas. Both forms of theory express metaphysical, and not scientific hypotheses, in a figurative and unwarrantable way. The metaphysics of the physiological theory is no better—is, it would seem, scarcely so fruitful in explanation—as the metaphysics of the ideation theory. Retention, like reproduction, is designed to explain the states of consciousness, as such, only by pointing out the conditions on which they, as actual states of consciousness, seem to depend. So far as retention does this at all, it is reducible to the well-known or imperfectly conjectured laws of reproduction; *as distinguished from the laws of reproduction, regarded as the preconditions of recognitive memory, there is no such thing known to scientific psychology as retention in memory.* Nor can we form the faintest conception of what is meant by the unconscious retention of our past experiences, whether in the form of brain-states or in the form of ideas within the mind.

§ 2. What is called the "retentive" power, or factor, of memory has been conceived of in two different ways—the psychological and the physiological. The popular language runs *as though* the representative images were "stored away" in the mind, and then sprung forth or were brought forth by involuntary or voluntary "recall." Such language has been in all ages converted into a metaphysical theory. Thus Plato and St. Augustine regarded the ideas as existing, somehow retained, in the mind. But whatever theory we may defend as to the mind's entity, we can neither conceive of it, nor of the nature of ideas, so as to justify any other than a confessedly figurative use of such language. What corresponds in real experience to the figure of speech is nothing beyond the fact and the laws of memory. No more defensible than the ancient view is that of the modern Herbartian school, or of the psychologist Bouillier[1] who declares: "No idea, at least of those which memory may recall, ever leaves the mind entirely. . . . To remember is to have new consciousness of what has not ceased to exist in

[1] See Le Principe vital, p. 408 f.

the soul." Truer to science, by far, is what the poet Longfellow makes Prince Henry say:

> "Themselves will fade,
> But not their memory,
> And memory has the power
> To recreate them from the dust."

The modern physiological theory has by no means always escaped a similar unjustifiable metaphysics. It has spoken as though the so-called retention of ideas were in the brain—in the manner of "scars," as it were, or of nerve-cells "polarized" in the position given them—to which the "epiphenomenon" of consciousness only needs to be accidentally added in order to account for recognitive memory.

The truth of the physiological theory of memory is simply this, that the recurrence of similar forms of associated cerebration is the conjectural physical precondition of the reproductive process; and so of recognitive memory. This inferred fact of recurrence is properly held to be indicative of molecular tendencies, habits, disposition, etc., in a manner which has already been sufficiently explained (see p. 242 f.). But these words when applied to the brain, as well as when applied to the mind, express nothing intelligible except as they are interpreted in terms of consciousness. They only serve to summarize the general fact, namely—so we infer or conjecture, the brain repeatedly behaves in a similar manner as a precondition of the recurrence of representative ideas in consciousness.

§ 8. Little need be added to what has already been said concerning the *physiological conditions of retentive memory*. They, as well as the psychical conditions, are both general and special. The original constitution of the brain, as implying sensitiveness to various kinds of stimuli, its capacity for forming a variety of habits of reaction, together with the unimpaired integrity of the nervous centers principally concerned in the different forms of perceptive acquisition, and especially of the association-tracts, are general and permanent conditions of retention. The special conditions are found in the state of the cerebral centers and association-tracts when the original presentations occur, and also in the state of the same centers and tracts when reproduction takes place. In both the original and the reproductive activity continued soundness of brain-tissue and a proper supply of well aërated blood are the most important conditions. In this way we may give a general physiological account of why it is that some men have so much more capacious and retentive memories than others. Thus also may be explained why things acquired under some circumstances of health are remembered better than others; as well as why the general sanitary condition has such a marked effect upon the memory. In fact, no other faculty is more obviously dependent upon the condition of the brain than is memory. In the different ages of life this faculty is marked by certain quasi-cerebral characteristics. Indeed, it may perhaps be said that the developed faculty is not established until from five to seven or eight years. It is found that persons who become blind before this age do not retain visual images so as to dream or think in terms of them in after-life.[1] It is of the failure of

[1] See Jastrow: New Princeton Review, Jan., 1888.

memory that persons growing old begin first to complain, and the very nature and order of this failure emphasizes the physiological conditions of all retention. No experience is more frequent than that of failure in the attempt to fix in memory presentations of sense when the cerebral condition is unsuitable, unless it be the painful knowledge that we are unable to show we have retained what we try to recall when in similar bad condition. Many astonishing phenomena occur, however, which baffle all attempts to give them a satisfactory physiological explanation in detail. After fevers—for example—much or all of one kind of knowledge may be lost while another connected kind is retained. [Forbes Winslow even tells of a man who, after a fever, lost all knowledge of the letter *F*.] Then again the lost knowledge, without any assignable reason in cerebral changes, may come rushing back, as it were. In "aphasia of recollection" the patient may retain the memory of certain words and yet be quite unable to remember others closely allied. But in general, as says Kussmaul:[1] "The more concrete the idea, the more readily the word to designate it is forgotten when the memory fails." And this view accords, on the whole, with the order in which retention fails in senile memory. Sometimes, in spite of apparently insuperable physical obstacles, a wonderful reproduction of the past conscious experience takes place; and in moments of disease, of danger, and even of death, preceded by a time of apparent unconsciousness, a flood of unexpected memories often breaks in over the field of consciousness. These phenomena are partly to be explained by changes in arterial circulation; but of their complete cause we are still largely in ignorance. However, such occasional experiences do not disprove the rule that the constitution of the brain fixes, in a general way, the limits of every man's retentive powers; and that the conditions of health for the brain-tissue are also the conditions of good retentive memory.

§ 4. *The psychical conditions of retentive memory* are to be summed up chiefly with reference to the relation which attention sustains to the processes involved both in presentation and in reproduction. What impresses itself upon our interest, in the first instance; what accords with our permanent disposition, or with our temporary mood, at the time of acquisition; what is most thoroughly wrought by repetition under various connections into the texture of mental life; what is apprehended in the direction of our customary or more particular final purposes; what by prolonged and intense voluntary effort we impress upon ourselves, especially if we connect it with a number of other associated ideas that are to a high degree memorable; what by good logical consequence follows from facts and premises, themselves likely to be retained; these, and such like matters, are surest to survive the obliterative influence of time and so to be retained in memory. Or if we regard the successive fields of consciousness as biological realms, where the "struggle for existence" among the memory-images goes on, those that have the foregoing characteristics are "fittest to survive." The practical maxims for cultivating retentive memory which follow from these statements are obvious. But they all, if we include its various kinds (involuntary and voluntary), degrees, and relations to all fundamental processes of mental life, are seen to be connected with attention. Thus the rules for a good retentive memory are

[1] Ziemssen's Cyclopædia, xiv., p. 759.

reducible to a judicious and economical expenditure of psychic energy under the principles of disposition and habit—the psychical correlate, as it were, of the physiological conditions of retentive memory.

And yet here, as in the case of the physiological conditions of memory, not a few unintelligible facts have to be taken into the final account. For, by no means infrequently, things which we have most carefully "committed" to memory, as in our very professional line, so to speak, and which all the reasons in disposition, repetition, voluntary purpose, and natural or acquired interests, would seem to co-operate in retaining, slip away from memory, apparently forever. Or, at the very time when the greatest provocation to recall them has arisen, we find they have been only imperfectly retained. Thus the name of a person whom we have long known and are desirous of addressing properly, is gone at the moment when we take him by the hand; in which case we are scarcely more vexed with ourselves than when, hours afterward, we find it jumping unbidden, and even unsuggested (?) into our minds as we are greeting quite another person or quietly reading a book. Contrariwise, no little rubbish which we never took pains to know, or even knew that we did know, clings with a fatal tenacity to memory. Such "parasites" of memory often attach themselves to our "standard" memory-images in the most grotesque and offensive manner. Sometimes we are not even sure whether the representative image should be assigned to memory at all, or rather to pure fancy. Thus Delbœuf tells[1] how he dreamed of *asplenium ruta muralis*, a plant of the very existence of which he (being no botanist) supposed himself to have no knowledge; and only subsequently did he discover that the name was indeed a memory-image fixed in his mind two years previously by the simple and forgotten act of copying it into a friend's album.

§ 5. There is a kind of retention in memory which has received insufficient notice from psychologists, but which is of considerable practical interest. We will call it "metamorphosed" retention—a sort of memory kept in consciousness in a form of substitution. For example, let us suppose that one has received from another, or given to one's self, some commission which must be remembered, some purchase to be made, business transacted, letter written, or lesson learned; but meantime one is employed about some quite different matter. The memory of the commission is "driven," as we are accustomed to say, quite "out of mind" by the present employment. But for all that the tone of the conscious mental life is by no means altogether the same that it would be, were this object not committed to memory for retention. A vague uneasiness (as of "something," "sometime soon," to be done), probably persists with considerable uniformity in the background of the conscious mental life; and this affective shading of consciousness is accompanied by frequent or occasional appearances of the object itself in a very obscurely ideated form. Thus the "fringes," as well as the "shading" of the successive fields of consciousness are *memorable of* the object designed at the right time to emerge into recognitive memory. Such a form of feeling and ideation is in some sort a substitute for the more careful record of the thing to be remembered; or we may say—the thing is kept in memory in a "metamorphosed" form. Hence the explanation of

[1] Le Sommeil et les Rêves, p. 107 f.

the feeling—bearing almost a trace of guiltiness—with which we have been oppressed when we were forgetting what we ought to have remembered; and to it the saying corresponds: "I thought there was something I had forgotten to do." The uncomfortable feeling and vague idea of something missing with which one arrives home when one has left one's cane, umbrella, or bundle, is of the same nature. Here the dim memory-picture of how the complex sensations of poise and balance ought to be, is contrasted with actual experience from skin, joints, muscles, etc. We express this contrast by saying: "I thought I had forgotten something."

It is altogether likely that the wonderful so-called "retention in unconscious memory," which certain patients display in post-hypnotic states, is partially to be explained in this way. They do not indeed retain in clear consciousness the memory of the things suggested to them in the hypnotic state. But apparently they do have somewhat of this "metamorphosed" memory, this substitution of obscure feeling and ideation for clearly recognizable and definite memory-images. The obscurer state is ready to expand into the clearer state, when the least favorable excitement from environment or from suggesting idea takes place. The condition of mind in which we find ourselves when, after some great sorrow, joy, or anxiety, we wake in the morning, before the definite memories of what has happened rally to the field of consciousness, illustrates the same principles.

The fundamental Conditions and Laws of Reproduction—the second of the three stages or factors of memory—are essentially the same for the more complex and highly developed presentations of sense, or states of self-consciousness, as for the simpler representative images (already sufficiently discussed, p. 241 f.). The concurrent development of other faculties, however, and their reactive influence on the development of memory, introduces several considerations which require attention at this point. As sense-perception grows more intelligent and purposeful, not only are the stores of memory enriched, but the trains of associated ideas become interconnected in more varied ways. The same object of perception suggests to the developed mind much more than was formerly possible. Physiologically speaking (and yet figuratively) we may say that those sections of curves, in which the "whole curve slumbers" (see p. 243), cross and recross each other in ever more bewildering complexity. But at the same time the complexity is kept reduced to order by the formation of reproductive disposition and habit. Education and environment constantly operate to induce the more frequent repetition of some associations rather than others; the already established organization into which society receives the individual tends to connect certain ideas together as suggesting and suggested, with what approaches a complete uniformity. Every individual in some sort enters into the inheritance of reproductive

memory which that portion of the race to which he belongs has prepared for him. Moreover, the particular forms of reproductive energy which characterize his individuality become more important as development proceeds. He acquires the associations of ideas, the suggestions of feeling, which are habitual with the class, the family, the profession, the calling, the "set," of which he is a member.

Two considerations introduce important modifications in the application of those most fundamental laws which apply to the mechanical reproduction of memory-images. These are (1) the development of intellect in connection with the acquisition and use of language; and (2) the effect of practice in the use of means for attaining ends. It is by *language*, as the token, support, and guide, of intellectual development that certain important reproductive activities of memory are alone made possible. A high degree of speed and accuracy of reproduction are attained only in this way. Moreover, fixed associations of the ideas with one another, and of the ideas with accompanying feelings, are greatly facilitated in the same way. By remembering words we are able to remember things and to recognize them; and by the use of words in the reproductive phase of memory our past experiences are brought before us in logical connections, and with that possible expansiveness which belongs to conception, to developed judgment, and to syllogistic reasoning. But, second, developed memory as reproduction shows increasingly the effects of final purpose, the results of the intelligent and voluntary adaptation of the faculties to the reaching of practical ends. As all of the faculties develop together, the individual may be said more and more to determine *what* he will remember; and *in what connections*—that is, as associated with, or suggested by, what particular mental occurrences. On the other hand, this very development of purposeful reproductive activity reacts to suppress or destroy the possibility of reviving clear memory-images of many former experiences. The formation of habit, the acquisition of tact and skill, themselves require that the reproductive series should be greatly "condensed;" and in the perfection of this process of condensation for the attainment of practical ends the memory of the members of the series originally existing between the beginning and the end are, necessarily, more or less completely lost.

§ 6. The interdependence of perception as involving recognitive reproduction, and of memory as the particular faculty of such reproduction, is intimate and pervasive. The completeness of our perceptive grasp upon any object of the senses depends largely upon how much we can remember

of what we have previously known respecting sensuously similar objects. This is none the less true because such so-called memory in perception does not ordinarily involve clear recognition of the place, time, and circumstances belonging to the previously known similar objects. Yet not infrequently we enlarge consciously our perceptive grasp by recalling that, at least somewhere and sometime, we saw, or heard, or felt, something like this. On the other hand, of course, the perfection of such perception stores memory with knowledge which will be constantly suggested, and so more or less perfectly recalled in all our new efforts at perception. So true is this as to induce certain writers[1] to claim that the powers of memory are not substantially different from the powers of apprehension. The same "traces" (*Spuren*) or tendencies growing out of past experience, are called "powers of sense-perception," in so far as they serve to strengthen and supplement new sensuous experiences of a like kind; and they are also called "powers of memory," in so far as they are brought to renewed excitation independently of such sensations. Another author[2] holds that all secondary states, or states of memory, differ from the primary only in degree. "Every case of memory is a case of sympathy." This is perhaps, however, to press a truth too far—so far, indeed, as to carry it beyond the borders of truthfulness. The same faculties, or fundamental processes of the mental life, are indeed involved in both memory and perception, and the relations between the two are those of inseparable interdependence; but the proportion is markedly different in all ordinary cases, and the different nature of the recognition as involving time-consciousness, entitles the two to be called different faculties (though only in the secondary and derived meaning of the word faculty). One important truth connecting memory and perception has been enunciated and illustrated in detail by M. Paul Janet:[3] "Memory is but the conservation of a synthesis accomplished at some previous time; it is clear that *memory* will not exist when the synthesis has not been formed, or even when it has been only half-made, and remains unstable and fragile." Hence that fixedness and order which the reproductive activity has when it attains the character of a recognitive memory of past objects of perception and self-consciousness, as distinguished from objects of imagination and thought. We cannot choose how we will remember things, or our own experiences, as we can choose how we will fancy or think them to be.

§ 7. The influence upon the memory of the individual which comes from the solidarity of the race, as it were, is of immeasurable importance. It is not by any means the experience of the individual which is organized alone into a system of suggestions and orderly reproductive activities. Undoubtedly I cannot *remember* the experience of any other one than myself; even the possibility of my doing this is inconceivable, and it is just this impossibility which marks the principal differences between developed memory and other forms of representation. At the same time, the actually dominant laws of reproductive activity are somewhat rigidly fixed for me by the conditions which embody the remembered experience of the race. Whether

[1] Compare Beneke: Pragmatische Psychologie, p. 189 f.
[2] Rabier: Leçons de Philosophie, I., Psychologie, p. 150 f.
[3] Revue Philosophique, March and April, 1891.

my reproductive activity is to be regarded as partly spontaneous, or as falling wholly under the laws of the association of ideas (contiguity, similarity, contrast, etc.), its contents, its pace, and the connections between its particular members, are all largely established by the society of which I am a member. This is not true simply of society at large, but it is also true in an even more important way of all the subdivisions of society of which I am also a member. These relations largely fix for me, in a relatively steady-going way, what suggestions shall be made, what memories reawakened. And when the habitually suggested memories are out of harmony with the environment, or the environment persistently fails to suggest the customary memories, one's whole consciousness of self and of time may be profoundly affected. Thus any man accustomed to stay at home, who finds himself for the first time in the surroundings of a totally different civilization, may have frequent occasion to ask himself: "Are these surroundings real (*i.e.*, such as connect themselves by recognitive memory with past perceptive experience) or am I dreaming?" He may even feel obliged to ask himself: "Am I the one whom memory seems to assure me I am, but about whose identity this seemingly imaginary (recognitively unremembered) environment leads me to doubt?" A somewhat similar testing of the influence of fixed associations upon the recognitive factor of memory, in the form of a doubt whether we are remembering reality or dreaming, comes when the "idols of the tribe"—whether in custom, opinion, or current doctrine—are temporarily seen to totter and be about to fall.

§ 8. But especially strong and pervasive is the influence of language upon the reproductive function of developed memory. A very large part of our adult memory is, of course, "word-memory." Nor is it in their direct relations to conception and reasoning alone that the usefulness of words consists. All tendencies and lines of reproductive activity are largely fixed by the language we have learned, by the manner in which we have learned it, by the feelings and volitions which have gone with its use. Since adult memory is "stored" in the form of words, the hearing or thinking of words may be indispensable to start the reproductive process; but the process once being started, the wonderful economy of word-memory becomes apparent. For since what is capable of being reproduced is embodied in the memory of some word, the character of the latter determines for each individual precisely *what* he will reproduce as embodied in each particular word. Moreover, words are remembered as connected into sentences—propositions, trains of argument, tales descriptive of past experiences, etc.; thus the memory of one part tends powerfully, or even irresistibly, to reproduce the memory of the whole. The memory, for example, of the number of a certain proposition in Euclid, or of the words "*pons asinorum*," or "binomial theorem," may carry with it an entire train of connected reasoning. If we could not cherish in memory certain words connected with our past (words as we popularly say, of "tender memories," or of awe-inspiring or mirth-exciting memories, etc.), then we could reproduce comparatively little of that past; then, too, our conceptions of self and of time would be most profoundly affected. Whenever we listen to a lecture or a book with the intention of remembering it, we are apt to try to impress upon ourselves as many of the words, in their connections, as possible. The subsequent re-

production of these words, with the consciousness of recognition, becomes the extended memory of the lecture or the book.

It is, moreover, to a large extent in the development of language-memory that all development of memory consists. That synthesis in presentative consciousness, which is necessary in order that the object may become an object for future recognitive memory, is an affair which requires time. Especially is this the case with all unfamiliar and complex objects, since they require so much of intellection—of analysis, synthesis, assimilation, differentiation, etc.—to perfect the work of presentative consciousness. Many of our experiences, however, follow each other so rapidly that this work of presentation is really impossible of accomplishment. Here language-memory is indispensable, if any memory at all is to be acquired. Hence when we are travelling through an interesting region on a railway train, or are watching any swiftly changing spectacle, or are taking any physical observation with an instrument, etc., we satisfy ourselves with mentally storing away a brief description of it all in words. Subsequent reference, as it were, to these few mental notes serves to reproduce the whole series of presentations for future recognitive memory.

The general health of the mind, its sanity or insanity, is to a considerable extent dependent upon the amount and character of language-memory. As a rule, though not always, aphasia and a general impairment of memory arise and develop together. As a rule, too, in old age or in mental disease, the reproductive powers fail in a certain order; those memories which are committed to abstract terms, and thus are peculiarly dependent on language, are the last to fail. This is because in the developed memory the associations which were latest in the order of development have become most fundamental; and the whole interrelated structure of the brain—all its centers and association-tracts—is involved in them.

Certain phenomena in reaction-time further confirm the advantages of word-association. For example—to refer again to results which have already been considered from another point of view—Münsterberg [1] found that reproduction in answer to such a question as, "On what river is Cologne?" occupied from 808 σ to 889 σ; but the proposal of a question in such form as the following: "Apples, pears, cherries, etc.; which do you like best?" shortened reaction-time to 694 σ to 659 σ. In both these cases certain words (as "Cologne" in the first class of questions, and "apples, pears, etc.," in the second class) are *full of memories* which they are ready to yield as soon as the reproductive activity is incited by attention being called to them. If, then, these "memorable words are got before the mind" early in the question-sentence the completed act of reproduction (choice being excluded by the associations already having been established in past experience) is more quickly accomplished. This is because a vast number of syntheses of a very complex order have already been made and stored away, as we figuratively say, in word-memory. Indeed, language-memory constitutes the principal portion of our "stock" ideas already bound together and ready for rapid and firm associated reproduction.

§ 9. Certain abnormal and diseased conditions of brain and mind are characterized chiefly by disorders of the reproductive function of memory.

[1] Beiträge, etc., Heft I., 1889.

When the rate of reproduction is greatly increased and discriminating consciousness can no longer keep pace with it, as it were, a hurly-burly of memory-images, a "maniacal" condition of memory, results. On the contrary, extremely slow and feeble reproduction may render the afflicted person unable to "keep up" with the ordinary pace of experience. *In either case the action of the faculty of memory partially loses its representative character and its claim to confidence.* In those conditions where the memory-images are so vividly reproduced, and so persistent in consciousness as to be mistaken for true perceptions (*idées fixes*), we are wont to speak of the mental disorder as an "insane hallucination;" but where a rapid succession of memory-images passes through consciousness, with a failure clearly to discriminate the fact that they do not represent real past experience, we lay the blame upon "diseased imagination." In either case, however, it is memory quite as much as perception or imagination which plays us false. There is, then, some truth in Schopenhauer's claim that "the health of the mind properly consists in perfect (*i.e.*, correct and full) recollection;" whereas madness is the broken-off thread of this memory. For the path of life is like the path of a traveller; and to be safe, it must be capable of being seen as it is in its entire length.

§ 10. The effect upon memory of that pursuit of practical ends in which life so largely consists is something marvellous. This effect is felt in two directions, which are both necessary to be followed, but which are, in their outcome as respects our reproductive energy, nearly opposite. What is necessary to remember so as quickly and correctly to reproduce it in consciousness in order to attain desirable practical ends, precisely that it is which one is interested in remembering. The child must be able to reproduce its experiences in the past attainment and previous use of things, in order to handle successfully the means for reaching again the same ends. This is true of all its learning, of the use of its own bodily organs, and of the simpler pieces of mechanism about it, in order to gratify its wants or to escape what is productive of pain. All such learning implies the memory (as reproductive activity with at least a faint element of recognition) of the various sensation-complexes (especially the visual, tactual, and muscular sensations) connected with the control of its own limbs. What this means an adult may experience by giving attention to the way in which, by practice, he acquires any form of skill or art. In learning to walk, to talk, to measure distances, and perceive forms, with eye and hand; and, indeed, in all learning, this method of intellectual activity on a basis of reproduced and recognized sensation-complexes is the one employed by the child. On the other hand, however, as soon as skill is attained in any satisfactory degree, the reverse effect upon the memory of the means to the end begins to take place. Attention is now directed immediately upon the end to the neglect of the means to be employed; the series of reproduced sensations connected with the employment of the means becomes more condensed; the members of this series drop out of the power of reproductive energy to bring them back; and the end is reached by a "leap," so far as reproductive memory goes, over the entire series of means. Thus Egger [1] pertinently calls attention to the fact that we have no "memory" of the sensations of touch and muscular

[1] In his De la Parole intérieure.

movement that belong to the vocalizing organs in speaking words; while we have a clear memory of words or sounds; and this is plainly because the direction of attention to the practical end—the word-sounds as vehicles of thought—has suppressed those sensations which were merely means to the end. In the same way it is the score which absorbs the attention of the accomplished musician who is playing at sight; thus certain black lines and dots excite the right motor activities in spite of a complete lapse from recollection of the acquired memory-images of tactual and muscular sensations. But who has not seen the nervous soloist—for example, on 'cello or violin—while the orchestra is playing the prelude to his accompaniment, practising mentally, in the way of reviving the images of the sensations belonging to a particularly difficult passage in the solo?

§ 11. Finally, *atmosphere* is a most important factor in determining the character of the reproductive processes in developed memory. With a pardonable extension of this term we may say that such "atmosphere" is of two kinds—(1) internal and (2) external. That is to say, the character of the reproduction at any particular time is largely decided by the mood and environment of that very same time. For memory is not unartistic; but, the rather does it, to a certain extent, follow the same rules as imagination and thought in its efforts to produce harmony and symmetry of total effect. The "systematic association," to which M. Paulhan reduces all the laws of the reproductive activity, is not governed by practical ends alone. It is in some sort as *an artist* that every man remembers what he remembers; and the influence upon the processes of ideation, in general, which comes from the underlying tone of feeling has already (p. 280 f.) been explained, both physiologically and psychologically. Everybody knows that in our sad moods we remember our sad experiences, and in glad moods our glad experiences, etc. Or if we follow the law of contrast, it is as sad pleasures, or as glad sadness, that we recall the opposite of our present mood. For—

> "Each substance of a grief hath twenty shadows,
> Which show like grief itself, but are not so"—

and the same thing is true of all our experiences with a decided affective tone. This artistic harmony between memory and presentative consciousness we, on the whole, prefer (as we are compelled, in the main, to experience it) to the distraction and pain which any habitual discord between present mood and reminiscences of the past would occasion.

In the same way we cannot be surrounded by any kind of predominating atmosphere without its effect on our reproductive energies being most marked. Here reminiscence is compelled to conform to environment. Thus a return to a foreign country in which we have once learned its language stimulates the memory of that almost forgotten language by means of the general correspondence of environment. Nor is this contrary to, but confirmatory of, the experience of Sully,[1] who on a first visit to Norway found himself constantly reproducing Italian words. For here the generally foreign atmosphere, with its whole "peculiar complex of feelings," stimulated the memory of that particular foreign language which had been previously

[1] The Human Mind, I., p. 344 (note).

learned in a foreign (and so similar) atmosphere. In a *foreign* atmosphere, foreign language and foreign customs are alone consistent with the interests of artistic unity.

The word "Recollection" is well adapted to emphasize the dependence of the character of the reproductive activity — its time-rate, direction, and completeness as respects the vividness and life-likeness of representative consciousness—upon volition. For the act of will seems to convert the otherwise passive and mechanical process of the arising in consciousness of memory-images, under the laws of association, into a definitely purposeful and spiritual activity. That there is a certain amount of psychological truth in such distinctions, experience, language, and practice all abundantly confirm. At the same time, in the more general but not less appropriate use of the words memory and will, such changes in the character of the reproductive activity are not abrupt as respects development, or lacking in an almost infinite number of degrees. These two faculties (memory and will) develop in mutual interdependence, if not with equal step; and even in the most highly developed exercise of the reproductive activity the amount of the influence from conscious volition varies greatly. On the other hand, all the differences above-mentioned (time-rate, direction, and completeness) are illustrated in the different cases of so-called passive reproduction—for example, in dreaming and hypnotic states, in reverie and dreamy contemplation, when we let our thoughts run back over the past as "*they* will;" and even in the highest moments of artistic energy. It cannot be denied, however, that the self-conscious purposeful volition to reproduce, in a definite way, changes greatly all these characteristics of the reproductive factor in memory. Within certain limits, and at some times more than others, we can remember what we will. The peculiar feature of this kind of memory is, that *voluntary attention, considered as a selective and distributive energy working toward an end consciously conceived of, controls the time-rate, order, and completeness of the reproductive processes in the interests of that end.* The very word interest recalls our thought to the intimate relation which exists between the more complex forms of feeling and the active, voluntary type of memory ("recollection proper").

§ 12. All highly psychological languages have recognized the distinction between active and merely passive reproduction. For example, we find in Plato, and still more in Aristotle, the distinction between ἀνάμνησις and μνήμη; in Latin between *reminiscor* and *memini;* in modern German between *Erinnerung* and *Gedächtniss;* in French between *souvenir* and *mémoire.* The

proposal of Hamilton to use the word "reminiscence" for active reproductions seems to reverse the customary English usage. But, in fact, this distinction—though valid and important—has many degrees which shade into each other; and neither purely active nor merely passive reproduction is often, if at all, accomplished in developed mental life. Hence the vacillating use of all the terms just mentioned; hence also the thought concealed in reflexive verbs for the act of memory (*sich erinnern, se souvenir*, etc.).

While we cannot appeal to definite acts of recollection as instances of a voluntary activity freed from all bonds of the association of ideas, nor regard, on the other hand, the adult mind as ever long wholly passive in reproduction, we can observe certain distinctive features of recollection, considered as active and voluntary reproduction. (1) In recollection some end is conceived of as being served by the reproductive process. This end may be either the recall of some memory-picture as a sort of end in itself; or the reproduction of the memory-picture as a means to some other end. Thus we "recollect" the past when we sit down of an evening to "talk over old times;" but the witness in a lawsuit may be stimulated to recollection in order to win his case or to get rid of a teasing lawyer. But this setting of the end of recollection before the mind itself involves memory. Thus it may be said that, in order to recollect, we must remember what we are called upon to recollect. (2) The essential thing about recollection, then, is the rendering, by an activity of will, what Sully [1] has called "a vague subconscious mode of representation," a sort of dim presentiment, into a complete recognitive memory. The word *re-collect* (to bring together into a whole again) signifies just this. Hence the significance and importance of "clews" in all acts of recollection. We figuratively represent ourselves as trying to "get hold" of the memory-image; we then consciously make use of it as a sort of handle, or token, for the rediscovery of the whole experience. Thus, in the effort to recollect, we find ourselves voluntarily fixating by attention the principal—though still inchoate and dim—features of the present reproductive consciousness. This process of fixating alters the time-rate with which the fixated elements pass through the field of consciousness, in two ways: they may either be slightly detained in consciousness; or, they may be recalled in so continuous a succession as partly to serve the purpose of a constant detention.

Now (3) if the fixation of discriminating attention on the so-called "clew" does not result in a satisfactory revival of the ideas associated with this clew, so as to form an act of recognitive memory adapted to our recognized end, attention is voluntarily redistributed, as it were. Other features of the dim presentiment are selected, fixated, and the results of suggestion as proceeding from these new centers, are watched. Again (4,) we may allow the more passive reproductive processes which are started by any one of the chosen clews, to run on for a time, in the hope that they will yet lead to effective clews; or that (as so often happens) all at once the reconstructed memory will be started in full and vital experience by the reawakening touch of some suggestion. We may even, for the time, voluntarily inhibit the active process of recollection, in the expectation (based upon much experience) that, if we will let "alone" the reproductive processes, they will by

[1] The Human Mind, I., p. 347.

and by do for us what we find ourselves unable to force them to do. We have, then, an acute consciousness of "being on the watch" for some portion of the desired reminiscence; or—sometimes for days and even weeks—we experience a recurrent and subacute consciousness of something wanting to make our mental harmony complete. (5) The character and amount of the psycho-physical and psychical activity corresponding to the conception of recollection profoundly modifies the entire current of conscious mental life. It is not the will alone which comes thus to be emphasized. In "trying to remember" (or voluntarily recollecting) we become "thoughtful," "careful;" we are under a sense of strain, a burden of obligation to perform a certain difficult mental function, as it were. Severe bodily and mental pains may result from the difficulty, or increased inability of recollection; and even peculiar reproaches of a quasi-ethical sort.

§ 13. Nothing of any scientific value respecting the cerebral processes involved in recollection, as active reproduction, can be added to what has already been said.[1] We have here to consider a certain peculiar mixture of those processes which are the physiological conditions of associated ideation with other processes which are the physiological conditions of will, as the activity of selective, fixated, and purposeful attention. This mixture of cerebral processes, therefore, necessarily involves the intense activity, with a practical simultaneousness, of wide-spreading connected areas of the brain. Especially is this true when—as is the case with all adult recollection—word-memory is involved. We are much tried in trying hard to remember; for the whole cerebral substance is being set into a high degree of exhausting activity. Hence the familiar pains and weariness, sometimes amounting to a feeling of anguish and confusion, as though brain and mind were giving way completely, which the suspense or failure of recollection occasions. Hence also the dependence of recollection, far more than merely passive reproduction, upon the integrity and healthy functional condition of the cerebral tissues.

§ 14. In occasioning, directing, and determining the result of this "hunt" for particular objects among the stores of memory, the effect of feeling is very marked. A lack of the feeling of interest renders it as truly difficult to recollect as to commit to memory for future recollection. On the other hand, in certain states of affective quickening all a man's stores of memory seem to be placed at the command of his will for the end held in view. In certain great historical speeches (like that of Huss before the Council of Constance) this influence of feeling on recollection is grandly illustrated. Every speaker who prepares himself beforehand and then ceases to consider further what he will recall, reckons upon the aid which the feelings of the occasion will give to his will to reproduce. Indeed, between *wishing* to recollect and *willing* to recollect the line is by no means easy to be drawn. But feeling of too violent and emotional a character, as well as indifference and lethargy, changes the time-rate, the direction, and the completeness, of voluntary reproduction.

In this connection we may remark the effect upon recollection which follows from the determination *not* to recollect (to forget, to "keep out of

[1] Compare, however, Maudsley: Mental Physiology, p. 159 f.; and James: The Principles of Psychology, I., p. 588 f.

mind") what is repulsive to some forms of feeling. This *inhibition* of recollection is the very opposite of the ordinary and uncontrolled result upon our memory of whatever strongly excites feeling; the result is a sort of attraction to recall, often amounting almost to a strange fascination. Few, indeed, are they who have not suffered much from being *obliged* to remember what they would gladly have forgotten—even the more bound to the recognitive recall on account of the association of strong and repulsive feeling therewith. On the other hand, men of will and of trained minds can refuse attention to those objects which they choose thus to keep below the threshold of consciousness; in this way by control of memory they establish habits of convenient forgetting. We are told of Kant that, being much grieved over the loss of his old servant, he wrote in his journal: "Remember to forget Lampe."

The Mental Activity which chiefly distinguishes the faculty of memory from all other most closely allied forms of faculty is Recognition. By this word it is meant that, *in a complete act of developed memory the present psychosis is consciously related to the past of my experience as representative of that past.* As has been said, recognitive reproduction therefore involves the consciousness of time and the consciousness of self; and these forms of consciousness develop, in mutual dependence, with the development of memory. Recognition is also plainly dependent upon, and necessary to, the development of all intellectual activity; indeed, as the very word re-*cognition* signifies, such recollection appears in consciousness as pre-eminently intellectual activity. Memory is, then, in some sort, a growth from that primary intellection in which the consciousness of similarity and of difference, and the processes of assimilation and differentiation, are implied. But recognition cannot be explained as a simple development of any one of these forms of consciousness, so called. To remember, with recognition, is not simply to have the consciousness of time —however highly developed—or the consciousness of self, or the consciousness of similarity and difference. Neither is recognitive memory to be explained as a compound of all these forms of conscious mental life. The rather is it a form of mental reaction *sui generis*, which, while depending upon conditions of retention and reproduction of ideas, under the laws of association, and involving the development of various other allied forms of consciousness, has still a unique character that transcends the conditions on which it reposes.

The degree of recognition which belongs to different acts of memory varies greatly; for the faculty of recognitive memory is subject to the laws of development, in the history of mental life. For example, I may be said recognitively to remember an object, an event, or a state of my own thought or feeling, which

I am only able in a somewhat vacillating and doubtful way to refer to "some time or other" in my past. Here the factor of recognition is at its lowest degree, as it were. So, also, in the rapid recall of series of past experiences, of each one of which we have a perfectly clear retentive memory; we actually often get over the ground of memory by merely touching, recognitively, each member of the series, and letting it go immediately. Indeed, if the process of recollection is very rapid, we may be said rather to recognize the series as a whole, while reproducing its members *seriatim*, with scant recognition given to each one. This is the meaning of the prelude with which it is customary to begin tales about ourselves: "Once upon a time I was," etc.; or, "It is just a year ago to-day that such a thing happened to me," etc.

That the memory of childhood is relatively in small degree "recognitive," in the higher meaning of this word, there can be no doubt. Children generally retain and reproduce the more vivid and lasting impressions made upon them in such manner as to suggest the predominance of the mechanism of association, with little or no clear consciousness of time, or of self, or of the relation consciously established between the present experience and the past experience of which it is known to be representative. Hence, in part, that unrecognized mingling of imagination with memory which is distinctive of the childish reproductive activity. Children are not as yet "selves" to themselves; they have no remembered past existence which is believed to belong to the world of reality, and to separate them as individuals from other individuals in this real world. In using the words "belief" and "reality" we suggest topics that, so far as descriptive psychology considers them at all, can only be undertaken later on. But we may notice here the true statement of Dr. Ward:[1] "It is plainly absurd to make the difference depend upon the presence of belief in memory and expectation, and on its absence in mere imagination; for the belief itself depends upon the difference instead of constituting it." Still is it also true that "belief" constitutes memory only in so far as memory is recognitive—is cognition, or *knowledge*, in a meaning in which imagination is not knowledge. For to speak of "knowledge" without implying belief and a "grasping on" to reality, somehow, is "plainly absurd." On the other hand, something more than mere recognition is implied in memory. Hence the truth of the further remark of the same author: "Memory includes recognition; recognition as such does not include memory; . . .

[1] Article Psychology, Encyc. Brit., p. 68.

there is an actual remembrance only when the recognition is accompanied by a reinstatement of portions of the memory-train continuous with the previous presentation of what is now recognized." But this is only to say that recognitive *memory* does not take place unless the representative object in consciousness is to some extent recognized as belonging to the *past*, and to *my* past. Here again, however we discuss the subject, we are brought around to the truth that, *in the highest development of memory we have a form of cognitive activity which is sui generis—a somewhat more than mere reproduction without recognition, and more than mere assimilation as implying recognition but without reproduction and the consciousness of time and of self.*

§ 15. All attempts to explain the recognitive activity by physiological conditions are hollow and vain. Not less hollow are those theories which assume that memory is accounted for by merely enumerating the facts and laws of the association of ideas, considered purely as facts and laws that have respect to psychical processes. The so-called retention of memory, or tendency to react in a given way due to having previously acted in a similar way, and the relations between the psychical processes due to established associations, have certain correlates in cerebral conditions and activities. Thus we may say that the intensity, complexity, time-rate, and succession of the ideas in the mental train depend upon, or are correlated with, the intensity, complexity, time-rate and succession of the cerebral processes. But recognitive memory is not to be explained *as though* it were a *mere* succession of images; or a *mere* succession of consciousnesses of any kind; or merely a succession of fainter impressions, resembling in character and time-order previously existing impressions, plus consciousness in general, as it were. As Professor James[1] has well said: "No memory is involved in the mere fact of recurrence. . . . A farther condition is required, . . . that condition is that the fact imaged be *expressly referred* to the past, thought as *in the past*. . . . But even this would not be memory. Memory requires more than mere dating of a fact in the past. It must be dated in *my* past."

When, therefore, there comes into the stream of my consciousness a state of which I may say, I *now* know, because I remember, that on such a day of the past (of July, '92) *I* climbed, in company with A, B, etc., Asama-yama, and looked into the crater, etc., then a kind of intellectual activity has been performed, whose factors and aspects cannot even be conceived of, much less definitely and scientifically established, as having physiological processes with similar categories.

§ 16. The presence of conscious recognition, with its accompanying feeling of familiarity, etc., in both perception and memory, brings these two

[1] The Principles of Psychology, I., p. 649 f. A similar attitude toward all the profundity of psychical life implied in the higher intellectual activities, and the impossibility of correlating these activities with definite cerebral processes, is implied in such passages as are to be found, I., pp. 147 (note), 158, 161 f., 181, 297, 331, 578 (note), 581, and 591 (see especially what is said of the consciousness of "similarity," in the last passage). With all this it is difficult to reconcile the obvious meaning of the remarks on p. 667 f.

faculties yet more closely into relation. Indeed, there are certain mental acts which seem assignable to either of these two kinds of faculty with almost equal propriety. Such are those two classes of "redintegrating activities" where—it has been said—"mental evolution is but slightly advanced and where frequent repetition in varying and irrelevant circumstances has produced a blurred and neutral zone." Hence in childhood, where recognitive memory is little developed, neither perception, nor expectation, nor thought, is definite and clear. And as development goes on, a larger part of what was formerly brought into consciousness as something definitely *remembered* and somehow connected with *our* past, becomes merged in that general stock of knowledge which is only most vaguely recognized as having to do with the past at all, because it is our acquired knowledge. For example, we may say, with about equal propriety, either that we "perceive" the meaning of certain words or that we "remember" their meaning.

Acts of conscious reproduction which terminate in some at least weak form of recognitive memory must be distinguished from those which do not so terminate. For example, suppose that the Latin word *anima* is seen by a person who years ago learned its meaning and how to decline it. The order of ideas evoked in consciousness may, very likely, run as follows: "Soul" (or "breath"), "first declension," "feminine gender," "genitive in æ," etc. Afterward any one of a great variety of thoughts may be suggested, such as of the grammar in which, school at which, teacher under whom, or date when, etc., this linguistic lore was gained. Thus the meaning of the word *anima*, for a person who is still obliged to translate the Latin and yet has no difficulty in recognizing the meaning, is properly spoken of as *perceived* rather than as remembered. That is to say, recognition is so fused with the completed exercise of perceptive functions that the letters of *anima* cannot be perceived without its meaning in English—we will say—being "apperceived." What immediately follows of grammatical "lingo" is, however, probably to be regarded as a case of reproduction of a series of associated ideas (see p. 268 f.), with scarcely a trace of conscious recognitive memory. And thus much of the whole process, although it smacks of what psychology calls retention, reproduction, and assimilation, cannot properly be spoken of as memory, in the sense in which we are now using this word. Popularly, however, we should undoubtedly say: "You remember how to decline *anima*, I see." When, however, the suggested ideas of "grammar," "school," "teacher," and "date," follow in consciousness, the truly recognitive feature of memory—the higher intellectual function—becomes more emphasized; and now we may describe the stream of consciousness more truly by saying that images of how *I* learned to decline *anima*, in *that* grammar, at *that* school, under *that* teacher, at about *that* date, are flitting through the mind. But this constitutes true reminiscence; it is (at least, to some degree) *recognitive memory*. For we have here, however fitfully and faintly, all the necessary features of such memory; that is, the present ideating processes are consciously known as representative of what happened in the *past* that is *my* past.

The correct descriptive and explanatory science of memory will, therefore, avoid both of two extremes. It will admit, on the one hand, that many degrees of the recognitive activity, with all that is implied in it, belong to

different acts of memory; but it will, on the other hand, refuse to reduce this unique intellectual and reflexive function of mind to the terms of a psycho-physical mechanism. In some sort, *I transcend the present and connect it, by a true spiritual synthesis, into a known reality, with the past, in every act of developed recognitive memory.*

§ 17. The relation of recognitive memory to all knowledge, and to those convictions concerning reality which enter into all knowledge, is now to some extent apparent. It is such memory which makes rational expectation possible; and as well all reasoning with respect to the future—all rational looking forward, and all projection of remembered trains of ideation into an imagined as distinguished from a remembered time. While, then, the consciousness of time is necessary to the development of memory, the development of memory is also necessary to the developed idea of time, as present, past, and future—and all these with reference, always and only, to my now conscious self. To say this is not to reason in a circle; it is simply to acknowledge that interdependence of relations between all of the activities, phases, and stages of mental life, which all mental development shows.

Not only is recognitive memory necessarily related to all knowledge, and to all development of knowledge, but such memory *is* knowledge, of what really happened in my past. To the extent to which I really remember, to that extent I know; and as long as I do not doubt my memory, I do not doubt that I know and what I know. For belief in the trustworthiness of memory is, as we have already seen, something that belongs to its essential characteristics as recognitive. To attempt, then, to verify the trustworthiness of memory in general is to attempt something quite absurd. There is no possible guarantee of memory which resides, as it were, outside of memory. There is no corrective of one's own poor memory but a better memory; either one's own, or that of some other person who has had a similar presentative knowledge. Whatever appeal we make for the correction or improvement of memory we are in nowise getting around, or beneath, or above, the "authority" of memory and the "belief" which we have in its deliverances. In fact, on that authority and belief hang the perfection of our presentative knowledge and all the grounds of inferential knowledge; and so, of course, all that can be said or conjectured about the psycho-physical processes of reproduction, the cases of diseased memory, of double consciousness, etc. Unless the essential soundness of one's own memory be preserved, the very appeal to others to correct it becomes ineffective and even impossible.

§ 18. Yet here again we come face to face with the important, the almost omnipresent, principle of continuity. For a comparison of different acts of memory shows an almost indefinite number of degrees of correctness, and of assurance of correctness, belonging to them. There are disappointed expectations based upon mistaken memory, conflict of testimony as to the same things differently remembered by different memories, acquired knowledge of the influence of prejudice, interest, etc., over the deliverances of memory; and there are changes of memory produced, by further reflection, or due to sudden inbursts of clearer recognitive recollection, etc. But especially does experience force upon us a certain submission of particular memories to the memory of generalized principles; as when we conclude

that we must be mistaken in our recollection of an alleged fact, "because" of something else which we remember as necessarily following from a rule of conduct, or a law of nature. Thus we argue with ourselves, or hear others disputing: You *must* be wrong "because" it could not have happened as it *is* remembered. Not even in these last cases, however, are we actually setting up an authority over that of memory in general.

What is called "verifying" or "correcting" memory takes place in the following way: *Doubt* is thrown upon a memory-picture, either because of its own faint and vacillating character, or because it is opposed by some other memory, either of fact or of principle. A check to the smooth flow of the current of memory-images takes place, which is accompanied by a peculiar painful feeling of mixed perplexity, anxiety, and desire. The "clarifying" of the complex memory-picture thus becomes a problem, whose affective accompaniments afford a strong *motif* for its solution. Attentive and voluntary discrimination is excited and guided by the *motif*, and the processes of conscious purposeful recollection proceed in the manner already described. The result of these processes is either confirmatory of, or corrective of, memory, according as the final memory-picture is developed in consistency with the principal traits it possessed in its first form, or for one or more of those traits others come to be substituted. But no ground for belief in memory that underlies or overtops all memory can possibly be reached by such processes of recollection. Neither, in the last analysis, can we make the validating of memory depend upon comparison. The stream of consciousness flows on without ceasing; the present is not the past; the claim of the present psychosis to represent the past accurately can never be taken back to that past and compared with it. If we look at a flower and then close our eyes, or turn our back upon it, even for only that moment which is necessary to extinguish perceptive knowledge; or if we hear a strain of music and then wait only long enough for it to die away in our ears; and if then—being in doubt whether we remember correctly that flower or that strain of music—we resort again to the same percept for confirmation of memory; in all such cases *we only confirm memory by other memory, with an indestructible confidence in good memory as the very basis of the correctness of all developed acts of comparison.*

The distinction of Kinds of Memory is of little value for psychological science; it is, however, illustrative of principles already established, and useful in suggesting rules for the cultivation of good memory. Kinds of memory may be distinguished according to two principles of division: First, the relative amounts of faculty which are habitual with different individuals, or which enter into different acts of memory. Here the nature of the distinction is itself relative. Among such kinds are the tenacious and the spontaneous memory; the poor and the prodigious memory; the perfect and the imperfect act of memory; natural or logical and accidental or artificial memory; voluntary and involuntary memory, etc. The second principle has reference to the nature of the objects most spontaneously, tena-

ciously, and perfectly remembered. Here, of course, the division into kinds of memory is only limited by the number of kinds of objects which may be retained and reproduced in memory. This distinction also is merely relative. All kinds of memory alike fall under the conditions of retention and the laws of reproduction, as already described. A few words with reference to selected examples of several kinds will therefore suffice.

§ 19. The word "tenacious," as applied to memory has reference to the amount of forgetting, in comparison with actual or possible recollecting, which experience enables us roughly to measure. The very nature of consciousness, with its limitations of field, attention, etc., and the very nature of all memory, have been shown to involve forgetting as truly as recollecting. With all men by far the larger portion of the past (not only the years of early childhood, but also the details of almost every day's experience) is never actually recalled. But the amount actually reproduced in consciousness differs very greatly with different individuals; hence the merely relative use of the word tenacious to signify that some minds hold on to their past better than others. A "spontaneous" memory is one that reproduces, what it reproduces at all, on relatively little excitement from suggestion, as we might say, and generally with ease and marked rapidity in the sequence of the ideation-processes. While tenacious memory may be trusted to "hold on" to the ideas, however sluggishly and reluctantly it, at times, reproduces them, spontaneous memory is prompt, and, for the time being, generous "in delivery." These two kinds of memory may, or may not, coexist in the same person or in the same individual act of memory. A "poor" memory is relatively lacking in both tenacity and spontaneity; and a remarkable or "prodigious" memory would seem to require excellence in capacity both to retain and promptly to reproduce.

Instances of the prodigies performed by spontaneous memory are numerous enough. Besides the frequently cited case of the servant who, on being seized with a fever, talked in Latin, Greek, and Hebrew, what she years previously had merely heard recited without understanding a word, the butcher of *Bicêtre* might fitly be mentioned as an example; for this man, during his paroxysms of madness recited entire passages from the tragedy of "Phédre;" but on recovery he failed to recollect a single verse. Nor would it seem out of place to speak of *trained* spontaneity, like that of the juggler Houdin, who, after a few minutes spent in the library of a certain gentleman, astonished him by repeating "right off" the titles of his books; or like that of the painter who reproduced from memory the altar-piece of Rubens, at Cologne, when it had been carried away by the French, and did it so correctly that careful comparison was necessary to distinguish between the original and the copy. Of men of truly prodigious memories, especially in certain kinds of objects—implying both tenacity and spontaneity extending to a wonderfully large number of presentation-experiences—history furnishes noteworthy examples. In the highest rank stand those who, like Scaliger, Niebuhr, and Pascal, combined the highest qualities of mind with the highest development of various kinds of memory. Of Pascal we are told by

Locke[1] that "he forgot nothing of what he had done, read, or thought in any part of his rational age"—a pardonable exaggeration of the truth in view of the really prodigious character of the great man's memory. Brandis declares that Niebuhr's memory was "equally retentive of perceptions and thoughts, of views and feelings, of sights and sounds." On a lower plane stand those generals who, like Cyrus, are reported to have known by name every soldier in their armies; or those statesmen who, like Themistocles (said to have known the 20,000 citizens of Athens), never forget the names of their constituency. Lower still must we place the mathematical memory of the mere calculators, or the musical memory of Blind Tom, *et al.* Thus we learn with astonishment the feats of memory of one Magliabechi, who, although brought up in ignorance and learning to read late, in his capacity as librarian proved himself able to repeat word for word an entire book after having once read it; or of Zacharias Dase, for whom a few glances at a row of 188 figures proved enough, so that he could repeat them, infallibly, forward and backward, and give the place of each particular figure in the series.[2] These performances testify to the incredible delicacy and tenacity of the cerebral mechanism of reproduction, and the possibilities of future reproduction that lie in its unimpaired structure.

Such words as "perfect" and "imperfect," when applied to memory in general, or to particular acts of memory, are plainly relative. They refer to the completeness of details with which the original presentation is reproduced in consciousness. Thus we are reminded of the varying degrees of life-likeness belonging to the representative image. But in developed memory the accurate placing of the image in the series of my past experiences, the *dating* of it with exactness, is characteristic of perfect memory. Natural and artificial, logical and accidental, voluntary and involuntary acts of memory have reference chiefly to the amounts of the intellectual and voluntary factors which enter into these acts. Habit and training are here chiefly determinative. In logical memory such relations as cause and effect, premise and conclusion, species and subsumed individual, are emphasized. But that "local memory" which enables one to recall the exact word or sentence, by means of its place on the page, may be called extrinsic and accidental.

§ 20. Marked instances of the memory of names, figures, musical sounds, etc., have already been brought forward. Nothing is more common than to hear a person saying: "My memory for faces is fairly good, but fearfully poor for names" (or dates, or abstract principles, etc.). In truth, every form of sense-perception may be said to constitute a kind of memory. Here the great differences which exist have undoubtedly an anatomical and physiological basis; and this we recognize when we speak of a "good ear" for music, a "good eye" for form and color, etc. In the language of Volkmann: "There are as many kinds of memory as there are kinds of mental representations. . . . *A* memory is everywhere; *the* memory is nowhere." Or, to use the head-line of Sully: "*Memory, a Cluster of Memories.*" This truth prepares the way for those differences which different

[1] The editor of Bohn's edition of Locke's "Essay" justly criticises the accuracy of this statement (see note, I., p. 268). For examples of remarkable memories, see Hamilton: Lectures on Metaphysics, p. 426 f.; and Beneke: Pragmatische Psychologie, I., p. 190 f.

[2] See Kaulich: Handbuch d. Psychologie, p. 88 f. (and notes).

persons exhibit in respect of the kind of objects which they remember best. The general fact also corresponds to the physiological theory of the cerebral conditions of memory. Thus in developed form we have the memory of the artist, the memory of the man of science, the memory of the philosopher, the memory of the practical man, etc. The memory of the great thinker or scholar is chiefly a word-memory. In general, also, the different forms of sense-perception are memorized with different degrees of clearness and completeness by different individuals. (Here compare what has already been said concerning the sensations and their images, p. 240 f.)

Valid and useful Maxims for the Art of Remembering follow from the laws of retention and reproduction, as already discussed. Such maxims may be divided into three classes, according as they have reference to: (1) Those general conditions of sound brain and sound mind on which the entire structure of the faculty, as it were, depends; (2) the conditions, especially governing the fixation and distribution of attention, of the original experience which it is designed to remember; (3) the nature and variety of the connections between the particular memory and the entire structure of associated mental life. Under the first class fall exhortations to keep the brain tissue sound and well nourished with properly aërated blood; to avoid excessive drains upon the elasticity of the cerebral centers, etc. Among the qualifications of mental sanity affecting the quality of memory, the *quasi*-ethical are not the least important; such as not to allow interest to falsify and cloud memory, habitually to refuse to be overhasty in conclusion of memory, etc. But both the bodily and the mental conditions under which the presentation is "committed" to memory must also be carefully guarded. Thus the effort to learn when suffering from cerebral fatigue or exhaustion is to be avoided. To control attention—with fixation, distribution, repetition, all directed to the desired end, and interest awakened and made to lend vividness to the impression—is the principal maxim falling under the second class. Closely connected are the maxims which require that advantage be taken of the laws of association in the cultivation of memory; for these laws are the "natural" modes of the recurrence of the ideas under the principles of contiguity, similarity, contrast, etc. Mnemonics, or "artificial" memory, then, furnishes safe maxims only so far as it follows these laws; that is, ceases to be artificial and becomes natural. But relatively non-rational or accidental associations *are natural* in the earlier stages of the development of memory; and, indeed, for such subjects, in all stages, as do not lend themselves readily to the higher forms of association.

§ 21. The early plasticity of the brain is such that the stores of new and more easily dissociable impressions should be accumulated before the end of the period of puberty. The more methodical arrangement and consolidation of these stores follows, in the form of memory of related things and memory of words. In middle life new acquisitions are relatively diminished, and the elaboration of experience into a more highly intellectual form, or the use of the past for the attainment of practical ends, predominates. These roughly marked periods need to be remembered in the application of means to the culture of memory. In all these regards, however, individuals differ widely; while some show an almost perennial youth in acquisition, without corresponding childishness in thought, others early display the senile inability further to stock memory with new ideas, or "to break the cake of custom" when it is no more than half-baked in the oven of experience.

§ 22. All helps to memory which cannot justify themselves by direct appeal to the natural life of the mind are likely to be injurious rather than helpful, however much they may temporarily seem to assist the "dead-lift" of petty but convenient memories. The founding of good, useful, and rational memory requires not only the firm holding in connection of the ideas, but also the ability to release them from their former connections and to unite them in new and higher combinations. Hence the pupil who has learned only in sight of the whip or of the promised reward, as well as the memorizer who has practised some cunning system of mnemonics, may share the fate of the "good man" who has done right only to secure happiness and escape punishment. Persons thus trained are apt to be powerless to effect new and higher associations. Even the great philosopher Kant is said to have been quite put "out of mind" by the loss of a button from the coat of a hearer on which, as he lectured, he had been accustomed to concentrate his attention. In the definite and petty associations with numbers, letters, geometrical figures, etc., which most systems of mnemonics recommend, the danger of establishing a sort of slavery of the recognitive processes is by no means small.

In all self-training of memory the limitations which belong to every individual should always be kept in mind. Much may be done to improve any one's memory, but we cannot all become Scaligers, or Pascals, or Niebuhrs in this regard. Neither should all aim to rival the inferior prodigies in the line of mathematical or musical memory, in memory for names, dates, etc. With a fairly serviceable and reasonable memory which is fitted to the particular purpose of one's calling and work, one may well be satisfied; and this is to be gained by judicious mental culture all around rather than by practising any special system of mnemonic gymnastics.

§ 23. Several important maxims, which are of especial service to the teacher of young children, may be derived from the experimental data obtained by Ebbinghaus and others. (1) Do not undertake too long tasks of memorizing, *in one effort*, as it were. It has already been shown (p. 67 f.) that the time and expenditure of nervous and psychical energy—beyond a certain limit, which is different for different persons, but generally not hard to find—increase far more rapidly than does the length of the task. (2) Find at least some *meaning* in what you attempt to learn, so that it may be

associated with the rest of experience in an intelligible way. (Comp. p. 272 f.) (3) Repeat with fixed attention until the object is "fastened" in memory (see p. 286); or, if this cannot be done without excessive expenditure of energy and time, repeat as frequently as possible the first attempts at memorizing. For forgetting is rapid at first and slower afterward; and established *recognitive* memory—other things being at all equal—makes, for its firm establishment, a large demand upon both time and energy. [Thus Ebbinghaus found that even 16 repetitions would often not secure recognition of his series of non-sense syllables the next day; sometimes 53–64 repetitions were necessary.] (4) Bear always in mind that really good memory cannot be secured without cultivation of the powers of perception and reasoning. Nor can the conscience and the heart (the ethical and general affective accompaniments and factors of knowledge) be left out of the account. *For, although memory often seems to be a sort of special and isolated piece of psycho-physical mechanism, if the faculty is to be developed as a fountain of knowledge, we must reckon with the whole man—brain and mind—as the subject who remembers.*

[In addition to works cited at the end of Chapter XIII., and in this and preceding chapters, the following, on Memory, may be consulted: Articles in the Am. Journal of Psychology, ii., 1–8, by W. H. Burnham. Dugald Stewart: Philosophy of the Human Mind, I., chap. vi. Sully: The Human Mind, II., Appendix D. Taine: De l'Intelligence, ii., 1–2. Among the many treatises on the cultivation of Memory the following, especially the first, perhaps, deserve mention: M. L. Holbrook: How to Strengthen the Memory. Pick: Memory and a Rational Means of Improving it. Kay: Memory, What it is and How to Improve it. W. L. Evans: Memory Training.]

CHAPTER XVIII.

IMAGINATION

As compared with memory that development of reproductive faculty which we call Imagination stands partly on a higher, and partly on a lower, intellectual plane. On the one hand, the psycho-physical mechanism may bring into the stream of consciousness an elaborate train of representative images, if they are not to be placed in my past by recognitive recollection, with but very little development of intelligence. It is chiefly as acting in this way that we strive to picture to ourselves the mental life of children and of the lower animals; it is somewhat thus that certain philosophical tenets represent the life of the "world-soul." And it is this kind of life which, for the most part, we live in dreams, where the representative images are generally of a highly schematic and vague character, and very little definitely *recognized*, in the stricter meaning of this term. In reverie and day-dreaming, memory and imagination go hand in hand, and both may lack the chief characteristics of higher intelligence. But on the other hand, it is by imagination that the inventor, the artist, or the poet (and even more, the man of pure science or of philosophy) transcends all the memories of his own past, and even, in the case of genius, of the past of the entire race; while, as Schopenhauer says, the man without imagination is related to him who has much of the highest development of this faculty, "as the mussel fastened to its rock, that must wait for what chance may bring it, is related to the animal that moves freely or even has wings."

In somewhat the same manner must we compare the imagination, as respects its place in the development of mental life, with the faculty of thinking. For here again we must place imagination below the power of forming conceptions and of making inferences, if by imagination we mean to indicate most of our merely reproductive image-making faculty. On the other hand, the dependence of thinking, in all its higher functions, upon the developed and trained power of imagination is undoubted. There is much also to make us sympathize with those who regard the

so-called "intuitions" of the artist, or the man of science and philosophy, as standing higher in the scale of intelligence than the "thoughts" of the same man—so far as by this latter term we designate psychoses different from the intuitions. It is imagination largely that makes what Balzac calls the "specialist," and declares to be necessarily the loftiest expression of man—the link which connects the visible to the superior world. He acts, he sees, he feels, through his "Inner Being." For, however much of offensive mysticism may cling to such talk as this, scientific psychology has still to remember that the facts of the creative and artistic life of man exist; and since they exist, they are not to be denied description and explanation, however stubborn they may prove themselves in the face of all pettiness from mathematical, or cerebral, or experimental science so called.

But, in truth, imagination and intellect should not be regarded as distinct faculties properly opposed. They must cooperate and interpenetrate each other most profoundly; although different sexes, ages, and individuals show these two sides of elaborating and reflecting consciousness in different proportions. Thus, some psychologists treat them as two directions in the development of the separating and combining activity of mind. Imagination, by more searching separation, gets at the interior content of the individual; thought, by manifold combinations of another kind, forms laws and principles, and opens up the so-called universal.[1] What is chiefly to be noticed, however, is that the merely reproductive forms of imagination closely resemble memory, with a low degree of recognitive energy; while the creative forms of imagination rather resemble that rapid and lofty thinking which leaps to conclusions with an immediacy and certainty comparable to the intuitive processes of perception. Both these two extremes, however, are connected by an indefinite number of intervening links. And in all imagination, memory and thinking are necessarily involved.

§ 1. It is scarcely worth while to enter into the controversy as to whether imagination shall be called a "faculty" or not. The Herbartians and the physiologists here again agree in denying such a title to this form of mental life. According to Volkmann, properly speaking, imagination is only a term for the energy residing in the ideas themselves, and is therefore different according to the differences of the ideas. Each idea has its memory, and every movement of the collective consciousness has its power of imagination. According to the physiologists the highest flights of creative genius are fully accounted for as reproduced cerebral activities formerly excited by external

[1] See George: Psychologie, p. 264 f.

stimulus, plus the epiphenomenon of consciousness. So far as merely reproductive imagination is concerned there is truth in the claim that it is not so much a faculty as a particular case under the association of ideas. It is in connection with the correlated development of intellect and will that the *faculty* of imagination develops; or rather, that the primary processes of ideation *develop into* the faculty of imagination.[1]

§ 2. Nothing additional remains to be said respecting the physiological conditions of reproductive imagination. In such cases as are more distinctively creative, we have indeed little but our ignorance to display. To a certain extent modern science confirms the vague impressions which, in all ages, have connected that constitution of the brain which is favorable to unusual creative and artistic imagination with tendencies to vagaries in so-called "practical judgment." The "great imagination, proper to madness," is supposed to mark the genius—in military affairs and in invention, but especially in poetry and other forms of art. That such unusual development of faculty implies an intense and widely extended use of the associated cerebral areas is beyond doubt, but we know nothing of the precise differences (chemical, thermic, neural), between those processes which are correlated with creative imagination and those which are correlated with other allied forms of the life of representation. Only since in the higher work of imagination the reproductive aspect is less prominent, and the more purely creative is more prominent from the point of view of consciousness, we may conjecture that the cerebral difference consists chiefly in the relative amount of neural "automatism."

But the most highly "creative" genius in respect of imagination *creates* only as he also reproduces; and hence has perceived and remembered. Especially must we insist upon the prominence of motor consciousness in the neural conditions of productive imagination. This involves something more than the mere starting of processes in the brain as the physical basis of this exercise of mental faculty; it involves profound changes produced in the peripheral motor organism as the result and as the concomitant and indispensable support of imagination. There are few things on which Kant insists with more of true psychological insight than upon this; in order to know a straight line, for example (as *a priori*, we may say) one must imagine it; in order to imagine it, one must draw it. Now "drawing" apparently involves motor activity—either actual or regarded as "traces" of past activity in the form of images of past strains, tensions, or movements. Further, in the act of imagining words, Stricker[2] has proposed to test the dependence of imagination on motor consciousness in the following way: Open the mouth and then try to imagine a word in which labials or dentals are prominent (as, *e.g.*, "bubble" or "toddle"). The profound effect of imagination upon the entire secretory and vaso-motor system is also emphasized by modern experiments in hypnotism. By suggestion swellings can be produced or made to disappear, secretions excited or repressed, and even, in relatively rare cases, burn-brands and stigmata, etc., can be produced. Every intelligent physician knows the close relation between imagination and the sanitary condition of the peripheral organs. The whole

[1] Compare Rabier: Leçons, etc., I., Psychologie, pp. 174 f., and 209 f.

[2] In his Studien über die Sprachvorstellungen, and Studien über die Bewegungsvorstellungen.

theory of ideo-motor effect on the skin and muscles, so necessary to the art of the actor, reposes upon the same basis of truth. Lichtenberg highly praised Garrick as an actor by declaring that he (by gift of vivid imagination) "appeared to be present in all the muscles of his body." The rise of feeling from the fainter forms in which imagination first excites it, to the highest pitch of emotional grandeur, is possible only on the same basis. *The complete physiological conditions of productive imagination seem to involve both centrally initiated ideation-factors and motor factors, both centrally and peripherally reproduced.*

The most important psychological Division of the Imagination is into Reproductive and Productive (or Creative). This distinction, however—like the others—is one of degrees only. As the type of the more purely reproductive form of imagination we may instance our dreams, or those phantasms which chase each other through consciousness when we are about falling asleep; or again, when we are lying awake and (excitedly or placidly) watching ourselves make pictures as it were. Here, however, the truly creative character of the work involved is often wonderful. In the wildest of our dreams the spontaneity of fancy may be most apparent; and there are few dreams where the whole pageantry does not show the soul of the dreamer to be an artist that makes much of a small amount of sensation-" stuff," by helping it out with large drafts upon the image-making faculty. On the other hand, it is customary to deny that the most supreme efforts of imagination can result in truly creating anything. Here, however, we must distinguish carefully our use of words. No object can, of course, be constituted by activity of *re*presentation which may not be analyzed into factors that have previously been, by discriminating consciousness, known as factors of presentation-experience. For so-called creative imagination, however, the factors themselves are *re-creations*—existing only while the mind creates them; and as respects the limits of combination, none can be assigned except those furnished by the most fundamental principles of all intellectual life. Within these expansive limitations the imagination creates (more divinely because consciously, and because more freely according to ideals) the world of both material and psychical sort with which it presents itself, and which it presents also to the apprehension of other minds. It is, as Professor Everett [1] has said, "the power of mental vision, a power which creates that which it beholds."

Reproductive Imagination develops in constant dependence upon the two closely allied forms of the general representative

[1] Poetry, Comedy, and Duty, p. 1.

faculty; these are memory and thought. Its character is defined by the return of the ideas in consciousness as themselves changed by the elaboration of experience. This change takes place chiefly in two directions: (1) The ideas are "freed" from those connections of place and time in my past which characterize the objects of recognitive memory. This form of imagination may then be considered as a sort of memory; that is to say, a complex idea which results from many impressions, arises without recognition of it as representative of any one of them, and without my dating of it as belonging to my past. Hence we speak of places and friends as we see them in dreams, or call them up in reverie, as either memory-images or as pictures of the imagination. (2) The concrete complexity, the richness and the vividness of the objects of reproductive imagination depend upon the total character of the mental development. Thus the growth of even the lower forms of fancy requires keen and analytic perception of those objects which are to be reproduced by act of fancy; it also requires the retentive memory, which holds in store the single features and the totals of the reproduced objects.

§ 3. The ordinary psychological account of dreams ascribes them almost wholly to the reproduction of mental images under the laws of association. No doubt reproductive imagination, so called, plays a large *rôle* in the drama of dream-life. But the writer of this treatise knows from a careful examination of experience that in his own case more or less of sensation-material is woven into nearly all his dreams. Indeed, a scientific analysis of most dreams, wherever the data are sufficient, shows traces of peripherally excited factors entering into the composition of the dream. These psychoses are, then, more like real "*fancy* sketches," made by the mind to account for its experiences, than pure histories of what has occurred under the laws of suggestion. The "stuff" of which dreams are made is *really* meagre; the *tale woven about it* by the imagination may be absurdly disproportionate. Such were the cases of the dreamer that explained to himself a straw between his toes with a dream about robbers who ended their assault by impaling him through the foot; or of the man who in sleep was forced into a mask of pitch which was then torn away with the skin of his lips—and all due to his being tickled about those organs with a feather; or of the asthmatic sleeper who projected his own distress for breath into the horse of the *diligence* that, in his dream, was carrying him over the Alps, and, having fallen down, lay panting and dying before his eyes. Thus, interesting and yet nonsensical pages of print may be read off in sleep—apparently from a book, but really from meaningless dots in the retinal field of vision.[1]

Now it is plain that we may speak of such work as this, either as belonging to memory, or to reproductive imagination, or to creative imagination,

[1] See the article by the author in Mind. New Series, vol. I., p. 299 f.

according to our chosen point of view. But certainly the fancy of thousands of dreamers nightly constructs tales quite as worthy of the title "creative," and quite as ingenious, as the greater number of the current novels. In this same connection may be mentioned the work done by the imagination of the insane; for example, the case of the Russian Nihilist, long imprisoned, for whom his creaking slippers, as he paced his prison-cell, became "the haunting voices of damned fiends."

On a still lower plane, psychologically, stand those instances of reproductive imagination where the members of the series are bound together into scarcely a semblance of dramatic unity. This is a form of development closely connected with that spontaneity of the image-making processes to which attention has already been directed. Here, as in dreams, an increased rapidity of metamorphosis takes the place of artistic combination. A certain creation takes place; but chaos is the result rather than a dramatic unity. Thus Grinthuisen tells us how he once dreamed that he was riding a horse, when immediately the horse became a buck, the buck became a calf, the calf a cat, the cat a beautiful maiden, and she, an old woman. The tree on which the cat climbed became a church, and this a garden; the playing of the organ in the church changed into the mewling of the cat and this into a song from the maiden, etc. Such "rout" of the imagination, or running riot of fancy, characterizes certain well-known forms of insanity. In some such cases, if the insane person is artistically inclined, or artistically trained, the product of the imagination may take on a vaguely suggestive and exceedingly weird character. Such are the songs sung, the pictures drawn, the poems and speeches composed in madhouses. Nor have instances been wanting where artists of alleged, or even of great real, merit have—especially, perhaps, in their later compositions, when unchecked tendencies to idiosyncrasies of fancy had developed—gone "half-mad," as it were, in their works of art. Indeed, certain passages in the greatest dramatists and musicians acquire the effect they have over our imagination by their suggestions of the author's fancy as having broken free from all laws of association, as well as all forms of reality. The capers of the clown, the carnival, the pantomime, etc., certainly do not excite what George Eliot has called "the exquisite laughter that comes from a gratification of the reasoning faculty;" but they at least spring from, and appeal to, one genuine side of imaginative faculty; they thus enable a good wit to "turn diseases to commodity."

§ 4. Fortunately, however, most of the activity of human imagination more obviously bows to some form of the laws of association, as dependent upon perception, memory, and thought. Thus, in some sort, by being less spontaneous and productive, the fancy is more tame and serviceable. Such is the imagination of the average, steady-going man in his waking life. Indeed, the character of its working determines, to a considerable extent, the difference between waking life and dream life. For, as we have already seen, imagination enters into all perception of things; as we shall soon see, it largely constructs the world as known to science; while the world in which all pure mathematics revels is its creature *par excellence*. But in all these cases imagination creates by reproducing under the limitations of memory as dependent upon past experience, and of thought as directed by the unchanging forms of intellectual development. With the average

man, in all matters, and with the highest sound imaginations in many matters, these limitations are narrowly drawn. They forbid the man of common-sense, for example, to imagine that water can burn; as they are said to have forbidden the king of Siam to imagine that it could become solid enough for elephants to walk upon. They forbid one to imagine that yonder object is a man, if one perceives it more than about six feet high and cannot account for the perception as illusory. They forbid some persons to imagine that a railroad train will ever run more than eighty miles an hour; and others, who can imagine this, that we shall ever really cross the Atlantic in flying-machines. All of us feel bound not to keep trying to imagine the body *A* as passing from *x* to *y* without touching successively every point along the line *x y;* but not bound to stop trying to imagine how atoms look and how luminiferous ether moves in the form of light-waves. It was the same kind of "common-sense" limitations of imagination which first led Mr. Spencer to posit the impossibility of "conceiving" of the Absolute; and upon such limitations, in no small degree, are the celebrated cosmological antinomies of Kant based, in a wholly mistaken way.

But the large amount of more truly creative imagination, hand in hand with thought, which modifies the development of the reproductive faculty of image-making, keeps pushing these limitations aside and moving beyond them. Or rather, the imagination itself lifts up and places further away the limitations, as it transcends them by its creative acts. How this is done we must now proceed to consider.

Genuine Productive or Creative Imagination, in the higher meaning of the words, involves much more than mere combination into new forms of the factors and objects of past experiences. Conscious selective activity must be directed upon these factors and objects with a view to the realization of an ideal; but in saying this, it is implied again that the highest exercises of so-called imagination require a corresponding development of the allied faculties of perception, memory, thought, and choice. Every ideal is itself a creation of the imagination (and herein the "newness" of the object is found); it may seem to spring from the first almost complete, as it were, into the consciousness; but it is more likely to be the result of a growth, and its very complexity in unity is significant of an intelligent recognition given to the necessity of *choice among many* factors and many objects of past experience. *Creative imagination is, then, always teleological; it is constructive according to a plan.* Such a complex mental performance involves (1) remembered experience in the form of past presentations of sense and of self-consciousness; (2) analysis, by discriminating consciousness, of these presentation-experiences; (3) desire to combine the factors, discovered by analysis, into new products—and this often accompanied by dissatisfaction with the imperfections of past presentations; (4) some, at least dim, mental picture of a

new unity to be effected by the combination, as its end (some semblance of an "ideal"—that is to say—held before the mind).

The interests served by creative imagination are exceedingly various, as respects the character of its ideals, the amount of conscious attention given to selection of means, and the amount of feeling involved, etc. They range all the way from a cook's construction of a new *ragout* or a new dressing for salad to the activity of the astronomer who rounds out the solar system by inserting the as yet unseen planet, or who traverses the space beyond the remotest discoverable star to form a picture of the universe. Strictly speaking, it is only by *productive* imagination that we can complete at all the otherwise fragmentary experience of sense and self-consciousness. By it one puts one's self the other side of the tree yonder, and so completes a picture of the object as having a far side as well as a near side. Only by it does one enter the arena of past histories, understand and enjoy biographies, comprehend and sympathize with one's fellow-men. Thus the child learns to play his part upon life's stage by practising, in anticipation, with an almost limitless variety of imagined circumstances. Thus, too, does the artist enter into the very heart of nature and intuit the beauty and the meaning which utterly escape all scientific analysis. Or, like the musician who saw "all heaven opened and the great God sitting on his throne," the believer in the tenets of religion transcends, by use of this faculty, the bounds of memory and of syllogistic reasoning.

§ 5. Detailed statements are scarcely needed respecting the question how far imagination can be truly "creative." Nor is it likely that such statements can be scientifically made and defended. On the one hand, fixed lines cannot be drawn in definition of the limits within which new combinations can take place. The *limits* of the combinations possible are very variously fixed—(1) by the ends sought through the act of imagination; (2) by the skill in analytic observation and synthetic power belonging to the individual; and (3) by the insuperable laws, the ultimate forms of the development of all mental life. Thus the limitations set by the ends which the man of science or the inventor recognizes differ greatly from those to which art subjects itself; and each form of art acknowledges, at least in some indefinite fashion, its own peculiar limitations (as respects material in which the idea of the imagination must be realized, method of procedure, etc.). Prose imaginative literature, for example, recognizes some vague distinction between the novel and the romance; the different forms of musical composition (oratorio, symphony, etc.,) observe other limitations. Again, it only needs saying to be credited that different individuals are differently limited in respect of this so-called creative faculty, according to the original constitution of their minds, their training, and

their past experience. But in attempting to deal with all this we are obliged to content ourselves with vague talk about those mysteries that lie back of, and beneath, the life of consciousness; while, on the other hand, the history of human imagination is full of the most astonishing surprises, of facts of sudden and single displays of productive energy that quite baffle all attempts at explanation from heredity, environment, and suggestion. Over all, however—serene and undisturbed, and eternal, as it were—preside the laws of mental development. For by this figure of speech we, in our ignorance, record the simple truth that space, time, and causation are forms of the activity of creative imagination, as well as of the most servile copying in memory, or of the most careful scientific devotion to the facts and laws of the real world.

On the other hand, it is ordinarily said (and to this we have already, p. 410 f. given a qualified assent) that no "perfectly new" creation is possible for the most active imagination. "The greatest imaginative genius," says Sully,[1] "would strive in vain to picture a wholly new color." But here much depends on what we are to understand by "wholly new." For the number of new colors employed in manufacture and the arts (now as compared with those of ancient Greece) has become enormously increased; nor do those who use their picturing faculty much in this way have great difficulty in constructing a fancy image of one of these colors when guided by the memory-images of other known colors. The process by which this is accomplished may be described somewhat as follows: Take *A* and *B* and put them together in such and such proportions to imagine *C*; or *B* is just about midway between *A* and *C*; or *B* is a little "off" from *A* or *C*. But limits of the productive imagination, as respects the construction of new "shades," "tints," and "colors," are not even thus easy to fix. Probably many persons, if they had never seen orange, could easily imagine it, on being told that it may be produced by a mixture of red and yellow. But the author has never yet met with any one who could, previous to the experimental demonstration, imagine what color (seal-brown) black with admixture of a little white and a little orange will produce.

In all imagination of wholly new creations the mind takes its point of starting from one or more memory-images; and then, by processes of combination or differentiation, it pictures the newly created object. But the different degrees of fusion and intimate association which the processes of ideation have already reached furnish all kinds and degrees of limitations for the imagination of the individual. Thus no color can be imagined except as colored extension; no degree of smoothness or roughness, except as smooth or rough surface, etc.

§ 6. It is customary to notice the dependence of imagination upon intellect, but the real truth of this relation has already been partially explained in a much more profound way. If by "intellect" we mean developed activities of thought and reasoning, as connected with the use of language, then such faculty may properly be said to be necessary to the development of the highest productive imagination. The profounder truth is this: both thought and imagination develop out of, and in dependence upon, processes of ideation co-ordinated with processes of primary intellection—or

[1] The Human Mind, I., p. 365.

discriminating, assimilating, and differentiating consciousness. Especially important, however, is the dependence of imagination on intellective presentation-experience, on perception as an achievement of both image-making and thinking faculty. Such perception is as necessary to the man of imagination as to the man of science; but different aspects of the object are caught in the two cases, and the end sought in the new combination is also different. The imagination of the inventor and of the artist must both be stimulated and fed by discriminating perception; but in the case of a painter, his eye seizes upon the form and coloring of perceived objects in such an analytic way, and so fixes it in memory, that it may serve as material for his art in the future. The same thing is true of the musician, whose perception is the most "interior" of all artists. Apropos of this it may be noted that certain Japanese *kakemonos* represent their old-time musicians as wandering, with their simple musical instruments, in the solitary places of nature to catch the various notes which she emits. And because the musical art of this people never got beyond the lower imitative stage, it is confessedly inferior to that of European peoples; for imagination does not lose, but rather gains, in intellectual quality when it passes beyond the reproductive stage and constructs an ideal by fashioning over the elements of a past perceptive experience.

§ 7. The origin of all great creations of imagination is necessarily more or less enveloped in mystery. Especially is this true when we see them manifesting a relative independence of the development of what we call the "thinking faculty." In reflecting upon certain phenomena of nature, of the lower animals, and of the æsthetical products of human activity, one is led to refer much to the unconscious, or to so-called instinctive as distinguished from intellective and voluntary activity. But psychology, as the description and explanation of the phenomena of human consciousness, can only recognize in silence the so-called unconscious creative imagination of nature. The theory of instinct, whether in man or in the lower animals, is not much clearer; and, as has just been said, we are forced to admit that psychological science cannot wholly explain the origin of certain products of creative imagination. Certainly they, not infrequently, arise in such way as to give countenance to the word "divine;" and this word is, psychologically considered, far more clear and intelligible than is the word unconscious. Hence we have no fault to find — except to say that, of course, such phrases are not scientific—with Mozart's father, who designated as "a gift of God" the imagination of his son, when at first sight he played the grand organ, treading its pedals aright; or with Kepler's claim that, in imagining the laws of motion he "read the thoughts of God" after Him.

Scientific psychology is warranted, however, in insisting upon the truth that, as a rule, the growth of the products of creative imagination under the laws of association of ideas, and of intellectual progress, can be definitely traced. This is true for the individual; and it is also true for the race. Thus, if we are permitted to analyze the creations of the imagination (even those of the greatest genius), and are furnished with data for tracing the history of the author's mental development, we can largely explain the result in accordance with psychological laws. For the works of the great

masters are understood in the light of their note-books, sketch-books, diaries, or their biographies, their acquaintance with the works of others, their natural environment, teachers, etc. Only in all such explanation we are finally brought, as we are by all our attempts at explanation, face to face with the unexplained.

§ 8. The dependence of imagination on feeling and will is also obvious. Even more speedy, sure, and vivid are the stirrings of the affective accompaniment for this form of faculty than for perception or thought. To create well one must enter by feeling into the most interior life of that which one creates. This is true even of so-called cool scientific imagination. The astronomer, in observing or in calculating from data of observation, puts feeling as far as possible to one side. But in order really to imagine the enormous velocities of the immense masses through illimitable space, or the incalculable thermic energy of the central mass of the solar system, he must rise to the occasion on wings that take notice of their own flight. The influence of this affective accompaniment is felt in the time-rate of the imagination; it is beneficially quickened or perturbed, according as the feeling is excessive and inappropriate, or not. Conversely, it is by appeal to the imagination that feeling is aroused and guided. In fact, mere perception (if indeed we can speak in this connection of perception without imagination) has comparatively little effect on feeling. Thus the author of "Masks or Faces?" has shown that most great actors, not only by imagination put themselves in the place of the characters they represent, but also actually feel the appropriate affective accompaniments of those characters.[1] In ordinary affairs also, sympathetic feeling and a sort of "imaginative contagion" go hand in hand; individuals and groups of persons, when moving together for a common end, must be awakened and carried forward both on the side of emotion and on the side of imagination.

But cultivation of will is also indispensably connected with the development of productive imagination. Indeed it is the relation to the volitions which mainly determines the difference between the so-called receptive and the creative exercise of imagination. In the more purely reproductive forms of this faculty we seem to ourselves to let our fancy "run;" our imaginings are left to "take care of themselves." In certain less purely reproductive activities—as, for example, in listening to a poem being read, or to a drama being acted—we are called upon to create for ourselves; but we create as directed by the purposeful imaginings of another. In these cases even, it is left for us to decide whether we *will* construct the meaning of the poem, or the setting of the drama, in this particular way or in some other. Thus the higher forms of art are pre-eminently *suggestive;* they invite all beholders to an act of imagination; but they leave each beholder some choice as to what he will imagine. The secret of the beauty of the best Japanese art is that it appeals to the fancy in this way; its weakness, however, is often apparent in the form of a certain excessive vagueness, a lack of intellectual vigor, and a tendency to excessive sentimentalism. In similar manner Wordsworth's "feelings," that lie so "deep" and yet are excited by the "meanest flower that blows," are left to be rendered into almost anything of a definite sort that any reader may choose to imagine. This defect we express

[1] See a work by this title on the Psychology of Acting, by William Archer.

by saying "one does not know what to imagine." In the highest products of creative imagination, however, developed intellect and imagination both excite and guide the *choice* of an ideal, and of means carefully selected for its realization. The case of works of art is often presented as though lofty and pregnant imagination could be divorced from, or were even opposite to, the choices and stresses of volition and the conative onsets which we ascribe to will. But this is not so. In creative imagination of the highest order the man must will what he imagines, or no real creation takes place. Gautier says of Balzac that he did not "copy" the two or three thousand types which play a more or less important *rôle* in his "human comedy;" he *lived them ideally*. "He wore their clothes, contracted their habits, moved in their surroundings, *was themselves*—during the necessary time." For the freedom of the artist, and of the appreciative beholder of the work of art, is not independent of his choice; and this choice extends both to the factors and to their ideal mode of synthesis.

§ 9. But the work of creative imagination is by no means confined to genius, or to artists, or to persons of marked talent in their line. What is called the "real world" of daily experience is far more largely, than is at first supposed, the construction of the productive image-making faculty. The ideal world which this faculty mingles with the daily life of the average man is an inexpressible solace to the soul. For without his dream of some kind no man could well bear to exist. Thus we read of a certain house-servant who had cherished an ardent but never-realized desire to become a soldier; during the day the poor wretch cleaned boots, but by night he dreamed himself a major and in command of a regiment. In somewhat similar fashion children amuse themselves with play; the lover enjoys the presence of his absent mistress; the mother fondly dwells over the virtues and prospects of her far-away child; or the business man sustains and stimulates himself with the prospects of what he shall gain and be when "his ship comes in." On the other hand, all manner of depressing, fearful, and corrupting superstitions are baleful fruits of the productive imagination. Under its influence the same child who has played merrily by day covers his head beneath the bedclothes by night, or sits shivering in the dark room to which he has been consigned for punishment. If we are to believe Bourget—and many instances support the conclusion—it is with youth especially that the "frenzied power of imagination turns to torture." But savage peoples generally, and the more ignorant in all countries, produce by diligent exercise of this faculty a world of weird and horrid shapes and events that gain easily the belief in their reality which attaches itself to all objects of vivid constructive mental activity. And here the popular and the artistic uses of the imagination blend indistinguishably in their results; for varied "folk-lore," ballads, fairy tales, and fables thus emerge and become parts of literature. With men, generally, it is the creative imagination which adds so vastly to the significance of death—something far beyond that instinctive repulsion to the threat of dissolution which the higher of the animals are supposed to show.

It is not this pleasure- and pain-giving work of productive imagination, however, which we have here chiefly in mind. The rather is it the extension of that profound truth which we have already seen illustrated in many ways; perception itself involves idealization; the percept is largely the creation of

the image-making activity of mind. In saying this we do not reject the distinction between what we know to be real and what we know to be the result merely of productive imagination. On the contrary, it is only by development of the imagination, under proper discipline, that the way is prepared for establishing such distinctions in a valid manner. As Göthe said: "Imagination is the preparatory school of thought." For the child, the savage, the half-tutored man, the total world in which he lives is a very mixed affair, created scarcely less by his fancy than by solid perceptive and inferential knowledge. And for us all, however highly developed, the boundaries between the real and the ideal, between what we can say we know on irreproachable grounds of experience and what we imagine, are never irremovably fixed.

The distinction of Kinds of Imagination is somewhat important for understanding the psychology of this faculty. For productive imagination has many ends to serve, and these ends must be served in somewhat markedly different ways; while the purpose of memory is substantially one throughout. The importance of this consideration is enhanced also by the fact that, both in the scientific and in the popular estimate, the province of this form of mental function has been far too narrowly conceived.

The kinds of imagination may be distinguished according to the subjects to which its productive activity is applied. Such a division, though made on indirect lines, is a real classification, because the real differences in the exercise of the faculty are so largely determined by differences in its subject-matter and its chosen end. Thus we derive (1) practical imagination; (2) scientific imagination; (3) artistic or æsthetical imagination; and (4) ethical and religious imagination.

The foregoing distinctions in kind, although well founded, are relative and not mutually exclusive. For example, the imagination of the inventor or the artist must partake of scientific quality; nor can the discoverer of nature's wide-reaching laws dispense with mental activity resembling that which furnishes conditions for the highest art-work. Again, the æsthetical uses of imagination are most closely akin to the ethical and the religious, as the history of art and religion would confirm the analysis of psychology in showing. Yet further, since both the practical and the ethical concern the one sphere of conduct, it is evident that these two kinds are closely allied. In a word, the one creative human mind develops a variety of ideals that have respect to different forms of its interest and its activities, and by discriminating intelligence and selective attention, with choice, sets itself to the approximate realization of these ideal ends. Hence imagination is in some sort an underlying and unifying mental activity that overleaps those barriers of space

and time which reality respects, and thus binds the data of immediate experience into an ideal whole, in preparation for the supreme synthesis of the reasoning faculty. And if intellect chastens imagination with regard for fact and law, imagination outstrips intellect, since it is a pioneer and exciter of revolt against what is merely "conformable to past experience;" and with it the intellect cannot dispense.

The ordinary distinction between Fancy and Imagination is fairly well taken; but it introduces a subdivision which properly belongs under the æsthetical imagination, and which is somewhat vague, and at best only a matter of degrees. For these very reasons imagination is a much broader term than fancy. To apply the words "practical" and "scientific" to the term fancy would seem to be inappropriate; and it is only with some show of contempt that one would speak of the ethical and religious imagination as identical with a similar work of fancy. But certain art-work, which is the construction of the image-making faculty as related to the excitement of æsthetical feeling—may properly be spoken of as belonging under the rubric—"the fanciful." With this understanding even, we should hesitate as to where to classify many æsthetical compositions; for they might equally well be spoken of as belonging to fancy or to imagination. But, in general, fancy is distinguished from imagination (1) by having less regard for the probable as determined by known facts and laws; (2) by being less likely to be connected with practical interests other than that of mere amusement (fancy may be "tickled," imagination must be "awakened" and "fed"); (3) by being less bound by considerations of method in the attainment of its lower and more immediate end; (4) and consequently, by being narrower in the range of subjects to which it can be applied; (5) by serving more temporary issues, but tiring and disgusting if the attempt be made to render it an object of enduring or frequent intuition; and (6) when successful, by ministering to a lower form of æsthetical feeling.

§ 10. It is a truism to say that without *practical* imagination no occupation can successfully be carried on. By imagination the end to be attained, however lowly and immediate, is held before the mind and thus the nature of the practice determined; thus also are the separate transactions modified according to the relation which they are found to sustain as means to this end. For as Schiller says in his "Song of the Bell:"

> "It is just this which manhood graces,
> And 'tis for this his mind should stand,
> That in his heart he ever traces
> What he constructs with his own hand."

The savage who shapes to its more perfect uses his bow and quiver of arrows; the boy who, on beginning geometry, takes chalk and string in hand with the purpose both to realize and to perfect his inchoate idea of a circle or an ellipse; the mother who by anticipatory act of imagination fortifies her courage and resists the oncoming pains of maternity; or the patient who collapses at the bare sight of the dentist's easy-chair—all of us, in every deed of all our work-a-day living, illustrate the uses of the practical imagination. The entire world of experience is liable to be lived over in three different ways—once in imagination that projects and anticipates as here and now present what is really yonder and in the future; once in what we call actual and living experience, the immediate awareness of perception and self-consciousness; and yet once more in memory.

Those of the race, however unknown to history, who do the really fine and great things of a so-called practical kind, must have unusual endowment, good training, and active functioning of the productive imagination. Without this great practical enterprises cannot be planned or carried to any measure of success. As a modern writer on this subject has truly said: "Imagination is the creative origin of what is fine, not in art and song alone but also in all forms of action, in campaigns, civil triumphs, material conquests." Certain men of genius, or of high order of talents in practical achievements may indeed be lacking in certain kinds of productive imagination; they may be relatively poor in strictly scientific, or æsthetical, or ethical and religious imagination. But they cannot be lacking in that creative activity of the representative faculty which sets before the mind ideals of what is new and larger than the measure of past experience. So they who plan great business enterprises, or political and military campaigns, as well as they who plan dramas and musical compositions, must have minds of large capacity for some kind of productive imagination. And perhaps as many have failed miserably in such manner of enterprises through lack of expansive faculty, as on account of excess in devising generous plans for the attainment of high ends, without sufficiently careful calculation respecting materials and means of realization.

§ 11. To listen to the claims of certain modern advocates of the triumphs of science, one would suppose that all which is covered by this title must be founded on the most exact and carefully limited perception, with an extension only along strictly guarded lines of mathematical demonstration or reasoning, capable of being experimentally tested. But the truth is that what is called "science" is—all of it—very largely the work of constructive imagination; scarcely less largely so than is the work of the artist in words, or tones, or colors. Indeed, there are many artistic delineations of life (some of Shakespeare's plays, for example, or not a few modern novels) which we may know, by a careful comparison, to be more nearly true representatives of reality than—in all probability—certain current scientific theories would prove to be, if only we could ever *know* how correctly the latter do represent reality. As Professor C. C. Everett has said: "The theory of evolution, whether it be true or false, is as truly a creation of the mind as the fables of Æsop, where the monkey and the fox talk together. The fable may be more fanciful, the theory may be more imaginative."

Let what is called the "body" of any of the physical sciences be ex-

amined in detail when testing the statement just made. But, in the first place, let it be remembered that what is said to be observed is, in truth, very largely constructed by the imagination. No one accustomed to the use of the higher powers of the microscope can for a moment doubt this, as respects what is seen under its lenses. Indeed, *what is seen* depends, not so much upon the pure sense-data as upon interpretation — upon the reading into these data of the appropriate mental images. For example, in nerve-histology the cuts of the ordinary text-books picture imagined characters, the exact likeness of which no one can find in actual nerve-preparations. No one can find anything in particular in these preparations who is not himself prepared by constructive imagination to picture what he is to find. And the history of the growth of this science is full of illustrations of the truth that different observers not infrequently do find what they imagine they shall find. What is true in high degree of this most difficult science of observation is true—although in less degree—of all similar sciences. The demands made upon the mind by these sciences correspond with the method of training which they furnish to the mind. As a recent writer has said of geology, it trains the mind in "the method by which theoretical order is made out of the interminable confusion and complexity of natural things."

What is true of the observational basis of modern science is pre-eminently true of its theoretical development. For modern science is not more distinguished for its widely extended and carefully guarded observation than for its subtile and stupendous theories. But every theory is the product, of necessity and by virtue of its very nature as *theory*, of the constructive imagination. *It is a synthesis explanatory of facts by reference to an ideal principle.* And what a marvellous complex equipment of entities and laws is that with which the devotee of the natural sciences finds himself possessed whenever he resorts to this treasure-house of the picture-making faculty! Here are beings and modes of behavior, not only unlike anything that comes within the sphere of perceptive reality, but even combining within themselves the idealized potencies of most contradictory real qualities. Such are the luminiferous ether, the electricity that is a physical entity, perchance, without having mass, the atoms that are too large to be imagined as mere points, and yet not large enough to be imagined in terms of sensuous imagination, whether of sight or touch. The changes which are ceaselessly going on in these beings, and which theoretically underlie and account for all physical change, make the most exhausting demands upon constructive imagination, if we are to have any idea whatever as to what these beings are really about. Especially do biological and geological science, with their theory of evolution, require from this faculty an exercise, stretching through countless eras of time, and picturing processes in the wombs and brains of extinct animals, and in the capillary vessels of plants, etc., that no eye has ever seen or ever could have seen. And we refrain from speaking in this connection of those immeasurable "gaps" and "missing links," and "sudden leaps," and infinitesimally small "variations," on which imagination must draw *ad libitum*, if any satisfactory theory of evolution is to be set up and maintained.

These large drafts upon the human faculty for making pictures of the ideal are not here spoken of with the intention to reproach modern

physical science for excessive imagination. Far from this; but, on the contrary, our intention is to show that science, too, is artistic, and that her art is born of the same parentage with that of the poet and the dramatist. Only the important difference concerns the principles which regulate imagination in the two cases, and the character of the ends which are to be served. It is, moreover, a significant fact in history that many of the most important discoveries in mathematics and the natural sciences have been due to the constructive imagination of poets and philosophers. But has not Mr. Tyndall[1] himself declared that, when "nourished by knowledge patiently won, and bounded and conditioned by operant reason, imagination becomes the mightiest instrument of the physical discoverer?"

§ 12. It is universally acknowledged that artistic and æsthetical excellence depends upon the activity of creative imagination. The connection of such activity with the excitement of feeling has already been remarked; it will be still better understood after our subsequent discussion of the nature and kinds of æsthetical sentiments. Since the one end of all æsthetical imagination is to express and appeal to æsthetical feeling, the limitations of the different kinds of æsthetical imagination are set by differences in the means necessary to reach this end. Here, however, fancy, in its more ungoverned and grotesque forms, may combine the results of past visualizings into new constructions that regard only the limitations of space-form, while quite overstepping all the boundaries of material reality. Such are the "castles in the air," or "the houses that crown the top of Jack's bean-stalk." In the realization of this work of imagination the more particular limitations are further determined by the character of the material employed; this is also, of course, closely connected with the character of the end to be reached. By these forms of art not too complex ideas may be presented in pictorial form. "Pictures and statues are the books of the people," said St. Augustine.

In *music* notes of different timbre are combined in a rhythmic way by the constructive faculty. Here, however, the peculiarly "interior" quality of the material has a profound effect upon the work of the creative imagination. The painter, architect, or sculptor can project his visualizings into objective space, as it were, and look upon them as something separable from the activity of his own which creates them. For this it is not necessary that he should wait until the mental images have been set on canvas, or into wood or marble. But the musician, while composing, hears only the harmonies he creates, and creates them only as he hears them reverberating within the concert-chamber of his own brain. Thus we read of Mozart that the airs he wrote or played impromptu were only a part of those which the divine faculty played for him to hear; and that he could not well avoid listening to what was going on in his ears, or stop it sounding until it had been cast forth upon paper. All this corresponds exactly with the nature of the sensations and perceptions of sound. Further limitations are set to the imagination in music by the laws of consonance and dissonance. As to the growth of this form of æsthetical imagination the history of music is most instructive. Enlarged scope was given to this faculty when the discovery was made that two or more *arias* could be simultaneously sung, if only their

[1] The Scientific Use of the Imagination, p. 6.

successive notes stood in certain relations, without a disagreeable effect from dissonance. But only when the modern harmony succeeded counterpoint, was the wide world of musical glories opened before the creative imagination; and with the increased number and power of the musical instruments at command the artist in tones is, of all others, most gloriously free. Yet there is no more affecting tribute to the incredible achievements of the masters of this form of constructive faculty than to compare the works of Beethoven or Haydn, as rendered by modern instrumentation, with the feeble sensuous result which must have been produced by the instruments on which these masters composed them. It was surely what imagination wrought, and not what the senses received, that carried the tokens of such grandeur!

It is in *poetry*, however, that the constructive imagination attains its loftiest exercise; for here it is more completely joined with the higher intellectual processes of thinking, and it employs language as the vehicle of expression and means of appeal to other minds. Here, then, its creative work consists in combining conceptions into such pictorial forms as lend themselves to intuition of their meaning with an accompaniment of appropriate æsthetical feeling. Thus in poetry the whole soul expresses itself, as it were, through the channels of constructive image-making faculty. On account of the nature of the material employed (conception and its embodiment in words), poetic creations must be more "thoughtful" than is the case with the other arts—painting standing next in this regard, and music farthest away. Unless imagination is clarified by thought, its highest creative work in poetry is impossible. As Joubert has said: "The true poet has a mind full of very clear images, while ours is only filled with confused descriptions." But all the unfathomable mystery of life may be clearly imaged by poetry, as well as its recognizable aspects and more undoubted teachings, with a fulness and variety more nearly corresponding to reality than is the case with other arts. Hence, with the proper limitations, it is not wholly improper to say: "The imagination is in a special sense the poetic faculty."

It belongs to a more special psychology to discuss the mental origin and significance of all those various forms of pictorial representation which poetry (and, indeed, in a more limited way, all the other arts) employs. But the connection of the work of constructive imagination with perception should be again noticed here. It is not primarily the association of ideas by similarity and contrast which accounts psychologically for tropes, similes, and the various figures of speech which poets employ; it is rather primarily the activity of lively fancy or vivid imagination in connection with perception. The determining experience is, for the poet this—that he sees and hears something more than, and different from, the ordinary observer in the presentations of sense and of self-consciousness. It is the idea as intuited in the perception rather than as suggested by another idea which he catches as others do not. It is the fundamental difference in his perceptive interests and experiences which furnishes him with his peculiar equipment of associated ideas for the use of constructive imagination. In general, æsthetical imagination feeds upon what it finds, by intuition of the ideal, as present in the concrete and individual experience—the presentation of sense or self-consciousness.

§ 13. Finally, *ethics* and *religion* are quite impossible without a lofty and expansive use of imagination. It is requisite—as will be shown more clearly later on—to the exercise and development of conscience that some ideal of conduct and character should be framed. This is true of the very beginnings of what is truly ethical, and of the lower grades of its development. Until the distinction is made, however dimly, between what is and that which ought to be, the sphere of ethics has not been experimentally entered upon. But "*that which ought to be,*" *as distinguished from that which only has been or is now, must be constructed by image-making faculty.* And if we will reflect, we shall find that all conduct, as distinguished from mere action, implies the work of mentally constructing standards, ideals, and new combinations of means to be employed in the attainment of ends (what "I ought to do," or "ought to have done," under a given set of circumstances, in order to gain this, and to be that, etc.). The word "right," in its genuine ethical meaning, stands for some sort of an ideal; and all ideals are the construction of imagination, suffused with feeling and guided by reasoning faculty.

If what has just been said is true for the very beginnings of ethical life, it is, of course, pre-eminently true for the men of genius or unusual talents in this line of life. It has been said that "imagination has impelled even the saints and the martyrs of humanity." Leaving out the word "even" and changing the word "impelled" (for it is feeling that impels), we may at once admit that moral heroism is impossible without the power to construct high moral ideals. Indeed, the man who *seems* to be a hero in the matter of courage, fidelity, or self-sacrifice, but who does the deed by habit merely, or by stress of will, without any mental picture of its significance as related to some ideal, is no real hero at all. It is as true of ethical as of æsthetical imagination that it is essentially an *idealizing* process.

That the alleged entities and principles recognized by religious faith and worship are dependent upon constructive imagination no one will be found to deny. This is perhaps no more true, although more obvious, than the dependence of scientific theory upon the same faculty. In any intelligent use of words like "the Infinite," "the Absolute," or of terms designating the predicates and attributes and activities of Deity—such as his eternity, omnipotence, unity, and even his wisdom and truth, etc.—the combined energizing of imagination and thought, in a very high degree of the exercise of both these faculties, is necessarily implied. But the religious imagination is in many respects more closely allied with the æsthetical than with the scientific; while, of course, its connection with ethical imagination is so close and important that it is in fact difficult to separate between the two. Ethical and religious imagination, however, is more nearly allied to the scientific than to the æsthetical, in at least one important respect; it makes an appeal to observation and to inference, in the world of reality, for a support to its ideal creations. This—as has already been said—is one reason why fancy, as distinguished from imagination, is tolerable and even pleasing in art; but is not so in science, conduct, and religion.

The Development (and cultivation) of Imagination is an important part of psychological praxis. Its general rules, however, follow pretty plainly from the laws of the reproductive

activity as they have already been discussed. But since the culture should always be special, all the most appropriate maxims depend upon the conditions of the different kinds of imagination. The scientific imagination, as cultivated in a way special to its kind, will, of itself, scarcely be favorable to the development of the æsthetical or the ethico-religious imagination. It will even need much tempering in order to be most serviceable in so-called "practical life." On the other hand, a high order of æsthetical imagination is attainable with little or no ability to form an adequate conception of that world of atoms and forces and physical laws in which science revels. While that men who confess no difficulty in picturing the nature and the behavior of luminiferous ether, and of other imaginary physical entities, find themselves quite unable to imagine the entities of religion, there is no lack of examples to show. In fine, the very nature of imagination makes an "all-around" cultivation of it, to a high degree of attainment, very difficult, if not impossible, to achieve.

[In addition to the works already cited, end of Chapter XIII., compare the following: Addison: Spectator, Nos. 411–419. Leigh Hunt: Imagination and Fancy. Joly: L'Imagination. Maass: Versuch über d. Einbildungskraft. Frohschammer: Die Phantasie als Grundprincip d. Weltprocesses. Oelzelt-Newin: Ueber Phantasie-Vorstellungen. Rabier: Leçons de Philosophie, I., chaps. xvii., xviii. Friedrich: Die Entstehung d. Wahnsinnes. Cohen: Die dichterische Phantasie. Schmidkunz: Analytische und synthetische Phantasie. Löwenfeld: Physiognomik und Mimik. Siebeck: Das Wesen d. æsthetischen Anschauung. Hecker: Die Physiologie und Psychologie d. Lachens und d. Komischen. Du Prel: Psychologie der Lyrik.]

CHAPTER XIX.

THOUGHT AND LANGUAGE

On beginning the discussions of the two following chapters, it is desirable to distinguish the psychological from the logical point of view. Without unwarrantably disparaging the science called "formal logic," it only accords with fact to say that most treatises which bear this title make upon the unprejudiced reader either the impression of being commonplace or the impression of being remote from, and even unfaithful to, any psychical reality. It is customary to answer objections arising from the latter impression by saying that logic deals with the universal laws, or abstract and contentless forms, of the intellect. This answer, however, only affords a partial justification. It is undoubtedly an advantage to have the more obvious intellectual connections, which come to maintain themselves between the successive psychoses in the stream of consciousness, stated in the form of abstract and universally valid formulas. At the same time, the too wide separation of logic during these hundreds of years from its psychological basis has exercised an unfortunate influence upon the science; and it is hard to show that it has any right to existence as thus separated. From the time of its founding by Aristotle until almost the present day, the so-called "science of thought" has undergone little or no development. But when it received its shaping at the hands of that great master it could not derive its full legitimate benefit from a knowledge of the actual phenomena of concrete mental life; for no science of psychology (since Aristotle's *De Anima* sustains no such relation to all subsequent treatises on the soul as his logic sustains to all subsequent treatment of the laws of thought) existed at that time on which logic could base itself, or with which, as both sciences began to develop, it could keep pace. From its very nature, however, formal logic can never be anything but a subordinate branch of psychology; its sole province is to state—for purposes of convenience, it may be in symbolical manner—what are the forms which the psychoses assume, what are their implications, and what are the laws of their sequence, as by activity of

the relating faculty the development of knowledge goes on. But this is essentially what the psychology of thought and of reasoning also attempts. And the fact that logic aims to make its conclusions more indubitable, its statements of the general forms and laws of the intellect more universal, by abstracting from all concrete content, is of relatively little importance. Among the most genuinely interesting questions concerning the phenomena of mind are such as follow: What is the *real nature* of those mental processes for which both psychology and logic employ the terms "conception," "judgment," "reasoning" (inductive and deductive)? What *laws* must these processes observe in order to contain the truth, and mentally represent, in a valid way, what we call reality? and, How may the sphere of *knowledge*, as distinguished from the regions of conjecture, opinion, and mere belief, be enlarged? But the complete answer to these questions takes us beyond the bounds of the descriptive science of psychology, even if we include in it the subjects usually treated under formal logic and logical praxis. Indeed these questions suggest much that lies in that department of philosophy which we call Noëtics, or theory of knowledge.

Two differences, however, exist between the more distinctively logical and the more distinctively psychological treatment of the processes and laws of thought.

(1) Psychology treats, primarily, of the *actual processes* of mental life to which the names conception, judgment, reasoning, etc., apply. It regards this mental life as being what it actually is—a ceaseless succession of processes, a stream of consciousness in which different states and fields of consciousness follow each other without any possibility of pause. It is the nature of these processes and the actual forms of their sequence—the life of relating consciousness, which, like all mental life, moves on while it relates, and analyzes and synthesizes its own content as the successive "moments" of that content occur—which psychology tries to describe and explain. Logic, on the contrary, enacts the fiction of a so-called *product* of thought, which can, by abstraction, be considered as separable from the living process and as capable of thus being subjected to analysis in order to determine its nature. Thus logic treats concepts as products, differing in respect of "content" and "extent;" judgment and the syllogism, too, are regarded by this science as completed resultants of operative faculty—psychical entities, as it were, which can be analyzed into formulated arrangements of the aforesaid concepts. And so we are told how judgments are "formed" by combining concepts; and syllogisms and trains

of reasoning by combining judgments. In all this the real truth which psychology emphasizes is too often overlooked or suppressed by logic. *Concepts, judgments, and trains of reasoning are themselves, in actuality, only established forms of the movement of mental life;* and—to employ a suggestive figure of speech—it is the "morphology"[1] of intellectual growth which both logic and psychology aim to discover.

(2) The treatment of thought-processes by psychology, as compared with logic, differs furthermore in that the former constantly considers these processes as related to all the other mental processes in the total development of mental life. But logic speaks of "pure" thought and its laws, etc. Now there is no *pure* thought in reality; and the attempt to work out a science of such thought, independently of actual concrete thought-experience, is less successful, by far, than is the attempt to form a pure science of geometrical form and of number. For example, we cannot begin to understand the concept without constant reference to the representative image; or abstraction, without introducing the theory of attention; or comparison, without implying a true psychological science of perception and memory.

Without further reference to formal logic, and its successes or failures, from the point of view of psychological science, we may now define our purpose in the next two chapters as follows: We are going to trace the development of that faculty which is called "the Intellect," or the faculty of thought. For, in the broader meaning of the word it is *thought* which constitutes the essence of intellect; or rather, thinking is the distinctive function whose development conditions the formation and growth of intellectual faculty as such. But in doing this we shall build upon the basis already laid. Intellect proper—that mental functioning which is called conception, judgment, and reasoning—is a complex growth. It is dependent, like all faculty, in this sense of the word, upon other allied forms of mental life and upon their development. Its dependence upon the processes of ideation is especially close. Indeed, *all development of thought really is conditioned upon*—we might say without impropriety, *consists in—the changes that take place in the ideas and in the laws of their sequence, as the activity of primary intellection becomes more dominant under the guidance of a choice of certain ends of knowledge to be reached.*

§ 1. Since the development of intellect proper, or the faculty of thought and reasoning, involves the preparatory growth, as it were, of all the element-

[1] Thus Bosanquet gives to his excellent work the title, Logic, or the Morphology of Knowledge.

ary processes of mental life, a consideration of this development makes it necessary briefly to summarize our previous conclusions so far as they bear upon the topic. We have seen how, in the form of representative images, our past presentation-experiences are reproduced in consciousness. When thus reproduced they exhibit different degrees of intensity, life-likeness, and objective resemblance to the originals from which they are said to be derived. They also become related in various ways under the so-called laws of the association of ideas; or they are spontaneously reproduced according to the occasions furnished by our psycho-physical condition, our mental mood, and the various characteristics of the ideation-processes, original or acquired by repetition, etc. All such spontaneous or associated reproduction, however, is accompanied by certain intellectual activities which are the primary and indispensable conditions of mental development. The consciousness of resemblance and the consciousness of difference accompany the recurrence of like and unlike ideas. By processes which lie at the roots of intellectual life, and to which the name of "primary intellection" has been given, conscious assimilation and differentiation, and inchoate acts of analysis and synthesis take place. In all this, some at least rudimentary and primitive activity of judging is involved; and the dawnings of a consciousness of time are not far removed. In all this, conative activity, as displayed in the focusing and redistribution of attention, is also present, and the various forms of feeling, the affective accompaniments of all intellectual life, constantly exert an influence over the intellectual development. When, then, we come to consider the case of adult and developed perception, memory and imagination, we find that thinking and reasoning have already contributed to the formation of these faculties, in a very profound and comprehensive way. It is by conscious comparing, relating, analyzing of the wholes given to the senses or to self-consciousness as objects, and by synthesis of the recognized elements of past experience into new combinations, that we learn—so to speak—to perceive, to remember, and to imagine.

§ 2. It is not strange, then (to recur to a subject already touched upon, p. 408 f.), that certain psychologists deny the possibility of distinguishing between imagination and thought. Thus one author[1] holds that when the ideas owe to chance circumstances the conditions which control their coming into relations, we call the process "imagination;" but when they owe these conditions to their own constitution, as fixing the terms of their association, we call the process "thinking." There is, therefore, no line to be drawn between the two processes; they merge into each other by imperceptible degrees. So far as the foregoing statement involves the notion of ideas as entities influencing each other, we have already repeatedly rejected it. According to Dr. Ward,[2] however, "for psychologists who do not cut the knot, . . . it is confessedly a hard matter to explain the relation of the two" (here speaking of so-called sense and intellect). "Thinking may be broadly described as solving a problem—finding an $A X$ that is B. In so doing we start from a comparatively fixed central idea or intuition and work along the several diverging lines of ideas associated with it—hence far the aptest, and, in fact, the oldest, description of thought is that it is *discursive*." Still

[1] Ballauff: Die Elemente d. Psychologie, p. 94.
[2] Article Psychology, Encyc. Brit., p. 75.

another writer[1] goes so far as to say—and not without warrant—that *thinking* first begins at the point where the exploring movement of touch takes the place of planless reflex movement. The same writer holds that all the psychical processes become what they are only by thinking. In this way only does movement become voluntary movement, and sensation develop into mental presentation of an object, or into desire to attain an end. And the "stuff" (or problems) of thinking is no less than all those related elements of the psychic life to which *attention* directs itself. Once more, we are told[2] by another authority that "the first apprehension of a form, the primary relating of points and lines to one another, presupposes the activity of intellect; since consciousness, supported by the movements of the bodily organism, passes from point to point and connects them together," etc. Thinking is, then, one with consciousness in general; and if we distinguish these at all, we distinguish them as a development and a result. "Becoming conscious" (as we developed adults do) "is a process of thinking."

In discussing the Nature of Thinking it must then be admitted that the exact line where it emerges in distinctness from the other allied forms of mental life cannot be drawn with confidence. But, on the other hand, not to distinguish thought and reasoning from perception and memory, as well as imagination, would be more indefensible, psychologically, than to attempt to draw the line too rigidly. In fact, the distinguishing characteristics of thinking faculty—like those of all faculty—are the result of development. It is what we *become* capable of doing through activity of so-called Intellect, which marks off this power of mind from the other cognate powers. And on this point, in addition to what has already been said (p. 376 f.), we note the following:

(1) In thinking, the process of conscious Comparison is relatively developed and emphasized. In thinking, we "dwell upon" (and in thinking hard, we attentively "mind" or "pore over") the likenesses and unlikenesses of the objects that occupy the fields of consciousness. Thus we say to ourselves or to one another, observe *thoughtfully*, or remember *thoughtfully*; we even exhort the too fanciful man to regulate his imagination by *thought*. Hence thought *is* relating, and intellect has several times been called by us the "relating faculty." The more we think the more we compare—*A* with *B* and both with *C* or *D*; and thus, the more we bring out the consciousness of their resemblances and differences in preparation to unite the like and separate off the unlike. Illustrations of this emphatic feature of all thought may be taken from acts, either of perception or of memory, or of constructive imagination. For example, let it be

[1] Horwicz: Psychologische Analysen, II., p. 5 f.
[2] George: Psychologie, pp. 270 f. and 853 f.

supposed that one is standing before a complex building, or holding in the hand a new flower, and thoughtfully observing it. Then attentive comparison of part with part is going on; and of this whole with other similar or dissimilar wholes.

All such acts of comparison are expressible in judgments of comparison: "This cathedral is larger than the one at *X*; is more purely Gothic; has two or more steeples or towers; is built of such material; so many windows here; mullions ornamented so," etc. Or again: "This flower is blue, variegated with yellow; stamens so many; pistils so many; leaves oblate; name *A*; class *Y*," etc. So also in thoughtful memory one is comparing part with part of the memory-picture, and asking one's self: "Was the object or the event really like this precisely, or somewhat unlike? was the exact date of my seeing it, or of its occurrence, this or some other date?" By emphasizing conscious comparison we are said to "think out" the same result which, from another point of view, we ascribe to constructive imagination. And as we think we ask ourselves, is this or that combination best adapted to the end desired—most conformable to the accepted rules of literary or musical composition, etc.? Nor is it only in such elaborate instances of "thoughtful" perception, "thoughtful" memory, and "thoughtful" imagination that we convert the total state of consciousness into one of a distinctively intellectual order, by voluntarily emphasizing the act of comparison. Essentially the same thing happens in observing, planning, projecting, anticipating the most trifling matters whenever—as we so significantly say—we have time and inclination *to think*.

(2) Let us now examine what further takes place in all genuine thinking. The "condensation" of the results of comparison takes place. The changes in the processes of ideation already described as "freeing" of the ideas and "condensation" of sequent images (p. 285 f.) are preparatory for similar changes in the process of thought; and similar changes are furthered by all thinking. Repeated acts of attentive comparison of the like quality in different objects result in the immediate recognition of similar quality in newly perceived objects as *the same*—as *the* quality which no longer excites discriminating consciousness to a separate act of comparison, as it were. An act of conscious Identification is now possible. Thus discrete individual experiences are apprehended as having something in common, when they are experienced in connection with other qualities, whether of *X*, or *Y*, or *Z*. Each concrete similar now becomes entitled to one name *A* (*the* so-called color, "red" or "blue;" *the* exten-

sive motor activity of eye or hand, called "large" or "small;" *the* taste, called "sweet" or "sour;" *the* sound, as *of* a "cornet," or *of* a "violin"). So also by repeated thoughtful observation (with comparison emphasized, and memory and imagination called upon to yield their stores of like or unlike objects) any new object, similar to the known cathedral or the flower, may be identified as embodying the condensed results of many intellectual acts. Each building or flower in sufficiently large measure similar, is then at once apprehended as the "now well-known" *M* (a cathedral), or *N* (a flower of a particular kind). The complexly similar is identified as the same—whether it be experienced in connection with the space- and time-relations of *X*, or of *Y*, or of *Z*. Thus the idea which we have of the quality *A*, or of the building *M*, or of the flower *N*, is still further "freed," or made abstract by the condensation of the thinking process upon it. *When the individually similar becomes the universally identical, it is, as it were, made ready for immediate application to all sufficiently similar objects of experience in time to come.* To *thought*, every *A*, or *M*, or *N*—however different to sense or to memory—is made part of one experience. This process of obliterating all consideration of the particular mental existence of ideas, and of binding them together by judgments of comparison into forms capable of symbolic and secondary employment results in changing the merely representative image into the "conception"—the product, the sign, the conveyer, the starter, and the guide of thought.

(3) With this emphasis upon the act of conscious comparison, and its resulting establishment of resemblances and differences, another characteristic of thought is closely connected. The objects of our presentation-experience thus become *united* under those relations of resemblance which attentive comparison has emphasized. Something similar happens, of course, with the ideas representative of the same presentation-experience. It is on this account that some authors have spoken of thinking as a new combination of presentations according to their "objective" connection; and others have spoken of it as "the uniting and separating of ideas solely according to the nature of their content." By thinking, what is numerous and discrete in experience is organized into systematic relations. "Thought is the ordering of the manifold into a unity." Nor is the fact simply that, by thinking, the manifold and diverse materials get ordered and arranged into unities of one kind or another; but it is also true that we, in thus ordering and arranging them, become conscious of the relations which bind them together into

these unities. This is that higher synthetic act of intellect which makes Generalization and Classification possible.

(4) In order that the results of the activity of intellect in comparison, identification, and synthesis may be conserved, and that the psychoses which it makes possible may be used for the preservation and extension of knowledge, some further concrete means of "storing," as it were, these results is necessary. Such means, we have already seen, is found in certain concurrent modifications of motor consciousness—in the *symbols* of the unifying activity itself. More particularly in the case of man it is the *word*, the modification of the organs of expression (vocal or tactile) which can appeal to ear or eye, and so serve the purpose demanded. The discussion of the nature of thought is, therefore, inseparably connected with the discussion of the office and development of language. For Naming and thinking are closely correlated.

In these four conscious activities—Comparison, Identification, Generalization, and Naming—we find the entire essential nature of Thought. Whenever the stream of consciousness shows tokens of these activities we may speak of intellect proper as at work; whatever conscious being has actually performed these activities has learned distinctively to think.

§ 3. The conditions of successful comparison, and the degrees of comparison which enter into all truly intellectual acts, are various. The conditions may be classed as either objective or subjective,[1] according as they are connected with the nature of the objects as presentations, or with the nature of the individual mind. This distinction, however—psychologically speaking—only considers the same processes in consciousness from two different points of view. For example, a certain moderate intensity of any sensation or feeling, and a certain degree of vividness to any idea, is more favorable to comparison than a very high or very faint degree of intensity. But the subjective conditions of (*a*) attention, (*b*) pre-existing sensibility, either natural or acquired, and (*c*) mental preparation inducing adjustment, have an influence upon all acts of comparison as respects the intensity of mental impressions compared. So that for certain persons, or in certain conditions of body and mind for all persons, the intellectual "arousement" may be such as to make the nicest discriminations possible with either unusually faint or unusually intense impressions. In studying the quality and quantity of sensations it was found what discriminations are possible, when thought has penetrated sensation, when the conscious relating activity has been trained on a good natural basis to a high degree of discrimination (see chapters VII. and VIII.).

Much depends also, of course, upon the particular features of any two complex objects which are selected for comparison, and upon the favorable

[1] Comp. Sully: The Human Mind, I., p. 399 f.

or unfavorable relation into which we are able to bring them for purposes of comparison. In reality no so-called "same" qualities of two objects can be said beforehand to be precisely the same; they are only *so nearly* the same, *so similar*, that I do not distinguish the difference—perhaps because I cannot, or because I do not care to, or perhaps because it would defeat the purpose of my thinking if I discriminated too closely. But to another person what I consider the "same" may seem different, and so the result of his relating activity may express itself in a different judgment, in assigning the objects to another class, and in designating them by another name. Or, with another purpose in view, I may myself find the common features of the two objects no longer sufficiently similar to think them together as though they were the same. Furthermore, the indefinite complexity of all real objects makes it possible to compare any two, as respects a number of similar features (quality, quantity, or complexity of sensation-content, extension in space, duration in time, origin, use, class, history of growth, etc.). In some cases (as in that of two lines having the same direction and lying side by side) proximity is favorable to comparison; in other cases (as in that of the pitch of two notes of different timbre—violin and piano-forte in tuning, *e.g.*—or two weights lifted with two hands) succession is more favorable to exact comparison. Not infrequently, moreover, one quality suppresses another and makes its exact shading or its intensity difficult to distinguish; such is the influence of the hue of any color on its apparent saturation, or the influence of the interval of tones upon their pitch.

§ 4. The various processes which logicians emphasize in their account of the formation of concepts and of the pronouncing of judgments have all been provided for in what was said above. For example (*a*) *abstraction* is defined as the "withdrawal" of the attention, in an act of comparison, from some of the many elements, parts, or properties of a complex object, and its concentration upon the elements, parts, or properties made the subject of comparison; more frequently, but less properly, in logic, the term is employed in a figurative way to signify the "withdrawal" from the concrete whole of that element or property on which attention is concentrated. (*b*) *Analysis* is the taking apart by thought-separation of that which is actually conjoined into a concrete whole. This term, then, regards the same act of comparison from a somewhat different point of view. Successive acts of abstraction are, however, necessary to the completion of analysis; and analytic wandering of the attention is necessary to the completion of the act of abstraction. Abstraction and analysis, taken together, signify that the object which is given as a relatively undiscriminated totality is by thinking activity to be organized into the growing system of experience. (*c*) *Generalization* is a term employed to denote that the modified idea which results from thinking has somehow become capable of being applied, with equal propriety, to a number of sufficiently similar objects. It has acquired a certain generality of applicability. But inasmuch as all objects to which it may be applied are in this way made capable of being regarded as falling "objectively" together into a class, the process of thus grasping them together in thought is called (*d*) *classification*. Generalization and classification are plainly one essentially identical mental act regarded from two points of view; and the word which emphasizes the "unifying" character of thought—the newly construc-

tive stage of intellectual development thus reached by the relating activity—is (*e*) *synthesis*. This last term is, of course, highly figurative. That it is not to be interpreted as indicating the existence of entities, either below consciousness or in consciousness, as fixed and separable products of mental life, which are then "put together" *ab extra*, as it were, has already been explained repeatedly. But that thinking actually binds together the different elementary processes, with their objects, into higher and yet higher unities, there can be no doubt. (*f*) *Naming*—a term taken from that form of symbol which is distinctive of human thinking—or "denomination," is the process which fixes and makes subject to recall for further use the results of both the comparative and the constructive aspect of intellectual life.

It is customary to distinguish three kinds, or stages, in the process of thinking; and these are called Conception, Judgment, and Reasoning. From a slightly different point of view it may be said that the relating activity results in three classes of products—the concept, the judgment, and the argument. But concerning "products" of thought, as distinguished from processes of thinking, and tendencies and habits resulting in processes, it has already been declared that scientific psychology cannot speak. Conception, judgment, and reasoning must then all be regarded as *actual forms of psychoses in the flowing stream of consciousness;* the rather do we designate by these words *certain successions of psychoses which derive their characteristics from the nature of their sequence, and of the laws (or fixed forms) which are shown by the states of consciousness in this sequence.* These three kinds, or stages, are not, however, alike well fitted to reveal to us, on being examined, the essential nature of the thinking process itself; for this purpose the process called judgment is far superior to the other two. In the formation and expression of judgments the whole essence of the thinking process is involved. To think *is* to judge; and to use language as the vehicle and expression of thought is to pronounce—whether in one word, or in many words—a judgment. Conception and reasoning, so far as they are distinctive of intellectual faculty, are not essentially different from judgment; but both are reducible to the activity of judging. For to form a conception is to judge; and to use or unfold a conception is also to judge. Without the actual process of judgment the so-called "concept," in distinction from the representative image, has no psychic existence; the very word is itself an abstraction which needs an actual process of imagination, accompanied by judgment and supported by language, in order to give to it any meaning at all. And reasoning (whether inductive or deductive, demonstrative as in mathematics, or probable as in economics) has its whole nature explained when we have

shown according to what laws the different judgments, whose sequence *is* the actual process of reasoning, follow each other in consciousness.

A modern writer on logic[1] has declared: "Judgment is coextensive with affirmation and denial, or, which is the same thing, with truth and falsehood;" and again: "Thus truth and falsehood are coextensive with judgment, and depend on the fact which is its primary condition; the fact that a thing may have an ideal relation to reality over and above its own particular existence, so that its existence, though in itself real and actual, is empty and valueless in the absence of the further reality that such a relation demands." The fuller estimate of this declaration cannot be made until the nature of *knowledge* has been considered as the highest and most complex activity of mind, involving the disciplined and experienced activity, in harmony, of all the various so-called faculties. But two remarks may fitly emphasize, in this connection, the relation of judgment to all thinking, and of thinking to knowledge. (1) In all mature perception objective judgment is involved. Such judgment has been called "perceptive judgment"—the result of "minding" the particular object in its relation to other objects. Perception, therefore, affirms, as the result of an intellectual process, the "objective reference of an idea" as characterizing some reality given in sense-perception, but through it related to other reality—to reality as a whole. My perceptive judgment ends in my affirming such or such a thing as belonging to the world of my experience. (2) All so-called conceptions and reasonings have so much reality, and no more, as is possessed by the judgments which enter into them. Their entire truth or falsity is the truth of the affirmations or denials of the processes of judging which they embody or call forth. As "pure" conceptions or "pure" reasonings they may be regarded apart from the perceptive judgments which formed them, but thus regarded they have no "truth" or "falsity" in any other than the logical meaning of these terms.

§ 5. Our ordinary but most significant language clearly shows that we identify thinking and judging as though the latter contained the essentials of the former. To ask, What do you think *about* this or that? What do you think *of* him or her? What do you think the object here, or yonder, to *be*?—is the same thing as to evoke the judgment of another. Suppose that no doubt arises in the mind of either questioner or one questioned; then the judgment made (proposition, or *Satz*) calls for no defence by way of alleging grounds. But if doubt arises, then the judgment must pause until by inference, or consideration of a series of related judgments, such doubt can be

[1] Bosanquet: Logic, I., p. 72 f.

removed. "Against any *doubt*," it has been well said, "judgment maintains itself as an inference." To decide upon one's own "thoughts" is to settle upon certain judgments which one is ready to adopt as one's own and to defend against doubt.

The same truth is further shown when it is considered that, in all cases of the comparison of two or more complex objects, whether with respect to one or more qualities, the result of comparison presents itself as a problem to be solved by pronouncement of a judgment. For example: Do you think these two colors or tones, *A* and *B*, to be the same; or do you think *A* brighter in color, or higher in pitch, than *B*? Any thoughtful answer requires comparison, identification under the results of past experience, and a judgment. This has been called by Sully[1] the "discriminative problem," if the detection of difference is called for; but the "assimilative problem," if one is required to select the similar in two objects. For our present purposes such a distinction is unimportant. Thus the experimenter in psychology who gives to his reacting agent the problem to put one shade of gray exactly midway between two others, who solicits the child to distinguish blue and green, or who tries the ignorant savage to see whether he can count beyond the fingers upon his two hands, evokes a judgment. "Mind what you are about and think"—we say under such circumstances; and then your judgment (or finished thought—your "mind" upon that problem) will be correct. When Hegel, somewhat perversely, declares that to affirm "a carriage is passing the house" is not a judgment unless there is a question, *e. g.*, "whether it is a carriage or a cart," he bears witness to the truth we are illustrating. For in truth to *hear* either a carriage or a cart passing outside involves the results of innumerable previous perceptive judgments, based upon complex acts of comparison; it is itself (whether true or false, whether called in doubt or not) a perceptive judgment of a high degree of complexity. But if the question arises as to the meaning of this particular succession of sounds—"*Is it* a cart or a carriage?" then intervening judgments must be called forth in consciousness that may serve as grounds on which to base a final affirmation (or judgment). In both these cases, and *in all cases where we think as distinguished from merely having a succession of images succeed each other that may be regarded as severed from thought, judgment is the activity essential to our bringing the case under the thought-faculty.*

The true Nature of the Concept is now clear as seen in the light of what has been said concerning the complex mental processes which construct it. Both Imagination and Intellect, with memory exercised in the selection of certain elements of the objects of presentation to the exclusion of others, are necessary for those complex processes which result in what logic calls the formation of a concept. To use the more suggestive and vital language of psychology, *the process of conception is a union of the reproductive function of consciousness with the thinking function—the essence of the latter being the act of judging.* The representative

[1] The Human Mind, I., p. 404 f.

image is thus converted into a concept (the idea becomes generalized and takes on the characteristics of a so-called "general notion") as the result of an activity of thinking the relations in which it stands to other mental images or objects of presentation-experience. This "intellectualizing" of the idea is brought about by means of the judgments whose common subject the idea is. The effect of repeated acts of judging, all of which end in the identification of the similar as the same, and in the attribution of a class-name to all concrete examples of this similar, is the conversion of the images into a concept. Or rather—since we wish to escape as much as possible from the logician's fallacious way of regarding his terms as standing for products instead of living processes or movements of mental life—the development of thought reacts upon the reproductive activity; the mental states lose their concrete and life-like resemblance to particular originals which they reproduce; the consciousness of the more universal relations in which the particular ideas stand to each other becomes more prominent; the mental synthesis, which every complex field of consciousness actually is, now becomes more determined by the character of these general relations; and, finally, the symbol of this result of accomplishing an intellectual combination—namely, the Word—stands as the one individual and concrete remainder of the multitude of visual, tactual, auditory, and other images.

Every concept is declared by logic to be *of* "the general" or "the universal;" and thus markedly to differ from the representative image which is confessedly concrete and individual. It would seem, then, that some mark of such universality must be found in the actual process of conception, if the declaration of logic be in any sense true to the facts of mental life. But how can a process in consciousness which is always some *particular* movement of imagination and thought in some *one* stream of conscious mental life merit a claim to universality? For is it not always I, or you, or he, or some individual, who thinks, when the sequence of psychoses is strongly intellectual and conceptual, as truly as when this sequence is one of memories or of acts of picture-making? How, then, is my process of conception, psychologically and concretely considered, any more "universal" than my process of remembering or thinking? As a preliminary answer it may be affirmed: The psychological universality of the process of conception consists in the consciousness that we are mentally representing as "belonging together," as "really related," what is given in sense and imagination as manifold; that we are mentally representing as identical what is experi-

enced in presentation as various, in respect of place and time and other contents, without this variety being itself brought into consciousness. Hence it has been claimed that the consciousness of an identical reaction upon different presentations of sense or of self-consciousness lies underneath, as it were, all processes of conception.[1]

What has just been said of the difference between conception, as an intellectual process, and the merely reproductive character of the mental image, requires further elucidation. The process of conception may be concretely regarded from two points of view: (1) It may be regarded *as terminating in* the bestowal of *a name*, which is said to fix the result of this intellectual synthesis when completed, and to render it possible of easy and accurate recall. When an act of comparison has resulted in the mental grasping together of two or more similars as the same (the intellectual activity of "identification" which brings into an ideal unity the manifold of sense), and a symbol has been attached to the new mental totality, the conception is completed. But (2) the process of conception may also be regarded as *starting from the name*, and then proceeding to realize itself in such sequent states of consciousness as result from an effort to think out the meaning of the name. Postponing the further discussion of the intimate relations between the process of conception and that thinking which gives meaning to words, we may for the present regard the two as identical. And, in general, we have no other way to call up for introspection the actual form of intellectual life for which the term conception stands, than to think what the names of the objects conceived mean to us. We are forming a concept (or rather, performing an act of conception) when we are learning the meaning of any name—not, indeed, as a committing of words to memory, but as an activity of ideating and judging consciousness combined. And when we attend to what in our conscious experience actually interprets any name, we find ourselves exercising the same activity of ideation and judgment combined.

The Classification of Concepts into Kinds depends upon the various possible modifications and combinations of the activities already described. In the use of various concepts, it is the amount of condensation which takes place that chiefly determines the character of this use. In rapid and highly developed thinking the "name-image" bears within itself all, of a concrete nature, which is necessary to the conceptual process. Thus the purpose which "the word" serves is similar to that served by the

[1] See Stumpell: Grundriss d. Psychologie, p. 265 f.

x and y of the mathematician in the rapid handling of mathematical problems. A vague consciousness of ability, as it were, to stop and "think out" the meaning of the name, accompanies its use; such consciousness may be described as "conceptual consciousness"—a *mélange* resulting from the faint revival of the traces of repeated acts of comparison, identification, and generalization, together with the feelings of familiarity and of a tendency to ideate and to judge only in certain definite directions. Indeed, in rapid thinking—where the so-called conceptions follow each other in the stream of consciousness, borne along, as it were, by the succession of names—several words, or groups of words, may be summarized in one faint and sketchy act of conception. This resembles the grasp of the mathematician upon some familiar grouping of his symbols, *e.g.* $(x^2 + 2xy + y')$, as one symbol. On the other hand, if any name be dwelt upon—with a view to think out its meaning completely (or "realize" it—*i.e.*, convert the symbol into an actual process of conception), we find ourselves engaged in that same complex activity of ideation and judgment, in which it has already been declared that the very nature, pyschologically considered, of conception consists.

§ 6. Few subjects in psychology have been more discussed, and yet more unsatisfactorily treated than the nature of the concept. Three views have been historically distinguished: these are the "realist," the "nominalist," and the "conceptualist." But seldom or never do the advocates of any one of the three fail either curtly to admit from the rival theories certain claims injurious to the integrity of their own view; or else to hold their own view in such shape as to contradict the plainest facts of experience.[1] The view of the realist, in so far as it is metaphysical and concerns the relation in which the psychic process or act of conception stands to extra-mental reality, does not concern us here. But both realists and conceptualists, on the one hand, and nominalists on the other hand, habitually misrepresent the actual psychological state of the case. The same thing is true of much of the current argument as to the possibility or impossibility of abstract ideas. On this latter subject we find Berkeley, in his Introduction to "The Principles of Human Knowledge," maintaining: "I can imagine a man with two heads, or the upper parts of a man joined to the body of a horse. I can consider the hand, the eye, the nose, each by itself abstracted or separated from the rest of the body; but then whatever hand or eye I imagine, must have some particular shape and colour. . . . But I deny that I can abstract from one another, or conceive separately, those qualities which it is impossible should exist so separated; or that I can frame a general notion, by abstracting from particulars in the manner aforesaid." It has frequently been pointed out that elsewhere Berkeley, in a measure, contradicts the dec-

[1] For a brief Sketch of Theories as to the nature of the concept, see Porter, The Human Intellect, p. 406 ff.

laration of the passage just quoted, for he says: "A man may consider a figure merely as triangular, without attending to the particular qualities of the angles or relations of the sides," etc. But surely a figure "merely as triangular" cannot possibly exist as "separated" from "particular qualities" of angles and sides. As to what *can* really be done in the way of thus ideating, we need only refer to the entire theory of ideation as already established. Now, the word "idea," as here employed by Berkeley, plainly stands for the result of an attempt to visualize, as directed by selective attention, certain past experiences of visual presentations; and this result we have found to vary greatly in respect to *quasi*-"abstractness," according to the sketchy or schematic character of the constructive activity of imagination thus employed. But this activity itself varies according also to the end held in view by the act of image-making. Our *present* question, it will be remembered, concerns the effect upon "ideas" (in Berkeley's sense of the word) of those processes of thinking which end in the formation of a concept, with a name to fix it for future use.

Again, John Stuart Mill,[1] in his excessive nominalism, claims that whenever the name of a class is used intelligently, the mind must have before it some individual object either perceived or remembered. Instead of the term "abstract notion," or "concept," Mill would use the term *class-name*. But surely every name, as such, is only so much sound; and what psychology wishes to know is this: (1) What mental processes are those which make the use of class-names possible? and, further, (2) What mental processes are evoked by the use of class-names? The answer to both these questions is one and the same; it has been given in our previous description of the complex process called conception. On the other hand, it is the fashion of the conceptualist to argue as though some actual state of consciousness were possible, in which a notion, as a sort of statical product, devoid of all immediate influence from concrete processes of ideation, and at least logically separable from the act of naming, could be found. But when we search consciousness with the vivid light of introspection turned on, we do not find any such notion, or thought-product, actually existing there.

§ 7. The proper way, therefore, to realize the true nature of conception is to notice what follows in consciousness upon the presentation of the name of a class. Thus let the experiment be tried by pronouncing a class-name before a group of persons who are in an attitude of expectant attention as to *some* such name, but do not know what particular name to expect. It will be found that every successful attempt to "conceive" the meaning of such word, consists of a longer or shorter conscious series of more or less abstract images interspersed with judgments pronounced to one's self in language and "explicating" the meaning of the word. For example, let the word "lion" be the one selected for the experiment. Some hearers will immediately visualize the picture seen in a book in childhood, or revive the memory-image of the animal as seen in a menagerie; or more slowly reconstruct the detailed images of shaggy mane, a lashing tail, a pair of glaring eyes set in a hairy animal countenance, etc.; and simultaneously they will say to themselves—"this is a lion," a "lion's mane," etc. Others will make more prominent in the process of conception that part which the proposition

[1] Logic, B. I., ii.; and Examination of Sir William Hamilton's Philosophy, chap. xvii.

expressed in language bears; these will—with little or extremely schematic and vague ideation—exclaim inwardly: "An animal," "fierce" and "strong;" "it lives in Africa," or "in a jungle;" "a quadruped," "a carnivorous mammal of the genus *Leo*," etc. The process of sensuous ideation thus evoked by the class-name may vary all the way from that which the writer once heard described as an involuntary shudder running through the frame—a young woman's "idea of a lion"—to the completest visual scheme of the animal in the appropriate environment of forest or jungle. The more distinctively judging activity evoked in the same way, may be alike variable in completeness. And, indeed, in each individual response to any call for conception, the entire past experience of perception, memory, imagination, and thought, as embodied in a single word's import, may be involved. Nor will the result differ in principle, if the class-name selected for experiment correspond to some conception not capable of the same kind of realization—for example, the conception of "virtue," or of a "state," or of the "binomial theorem," or of the "Cartesian philosophy," or of Deity Himself.

When, however, the demand to follow in thought is made in such a way as to allow no time for the detailed conceptual process to develop itself—as is the case in all listening to speech, or in reading while talking to one's self—only a relatively small number of the symbols used have any marked individual influence on consciousness. The gross number of them, however, calls up a certain complex process which partially explicates them in the gross, as it were; a great many of the individual symbols contribute little or nothing to the total result in conception, but only vaguely determine the affective "fringes" of the stream of consciousness; and relatively few are either so dwelt upon in thought as to draw prolonged attention to themselves, or are stored as mere symbols in memory to be recalled for future application. Great, indeed, and even marvellous, is the power of condensation which the word possesses! It may be thoughtlessly spoken, but it is itself the epitome of all thought. We call that complex mentality which it represents in the past, and which it may evoke at any time in the future, by the term "conception."

§ 8. The terms employed by logic to designate the different characteristics, potencies, and results of the process of conception, so far as they represent anything psychologically real, all have their meaning explained by the foregoing remarks. Thus concepts are commonly said to be collections or syntheses of (*a*) "marks" or "attributes." That is to say, the thought-processes which end in the imparting of meaning to a name, have moved along the line of various properties belonging in common to many individual objects, and the mind has recognized that the name includes the synthesis, in all these objects, of these same properties. The properties are thus recognized as *marking* the concept. (*b*) Concepts are also said to have "content," or "intension," and "extension." By the former term we understand the number of marks grasped together in the synthesis; by the latter, the number of objects to which we know, or surmise, that the class-name, with its concept, may properly be applied. Thus the intension or content of geranium is greater than that of plant; for the conception of it includes more of recognized marks. But the extension of geranium is less than that of plant; for there are fewer objects to which the name geranium will apply than the

name plant. Intension and extension of concepts are often said to vary inversely; the more marks a concept embraces, the fewer objects fall under it, and the more objects a concept embraces, the more slender the knowledge which it conveys of any of these objects. But this is true only in a limited way, and when we allow of a selection and arrangement of marks with the design to illustrate this very rule.[1] In fact, the number of objects belonging under any concept is, in most cases, unknown; and the number of marks which may be, or should be, grasped together under any concept as its content, and to which the same name may be given, is variable and subject to development, in the individual and in the race. (*c*) The potencies, or "powers," of a concept are ordinarily said to be three—Definition, which expounds the marks and so represents the nature or specific character of the concept; Division, which enumerates the individuals or sub-classes included under it; Denomination, which affixes and interprets the verbal signs, so that they may be correctly applied. Into the details of all this, however, logic and grammar, rather than psychology, are interested to go.

The Nature of Judgment is further understood when we consider how the process which is called conception, and which terminates when the name is, to some extent at least, "thoughtfully" employed, modifies subsequent thinking itself. It has been shown that the very essence of thinking is in judgment, and without judgment representative images cannot be converted into conceptions. But those condensed results of thought-processes which the class-names represent, may themselves be further combined by higher forms of intellectual synthesis. The more primary activities of intellect become, as it were, points of departure and stepping-stones for the further elaboration, the more complex unification, of knowledge. Secondary or logical judgments are thus formed by the intellectual synthesis of conceptions. It was seen that, in the explication of the meaning of words, each individual passes a series of judgments which state the results of previous intellectual processes that have been operative upon material of presentation. Thus the conception which unfolds the name "lion" is for one person "a fierce and strong animal, living in African jungles;" while for another, it is a "carnivorous mammal of the genus *Leo*." But to think and say that a lion is an "animal" fierce and strong, or a "mammal" with the attribute "carnivorous," is to pronounce a complex judgment; and each term in this judgment is itself entitled to be considered as corresponding to a conception which, in turn, needs to be explicated in other judgments.

While, then, it is true (as said in treating of primary intellection) that judgment is involved in the earliest conscious discrim-

[1] See this ancient statement of inverse ratio between Extension and Intension, which is adopted by Jevons, criticised by Bosanquet, Logic, I., p. 58 f.

ination; true also (as has just been said) that judgment is necessary both to complete and to explicate any conception; it is also true that judgment (of this secondary and more elaborate character) may be a conscious synthesis of conceptions.[1] Such judgment consists of a bringing into relations in consciousness of the condensed results of previous judgments already equipped with names. In order to understand this further development of thinking, we must now briefly consider (1) the Act of synthesis, and (2) the Forms of synthesis, in so-called "logical judgment."

(1) In judgments like those which have just been cited, the proposition states no newly acquired knowledge. The explication of the result of thinking, as condensed in the conception with its name, represents only that series of judgments which is already implicit in the same conception. Because I know, or have already judged, a lion to be an "animal," a "carnivorous mammal," etc., I unfold my conception by repeating these judgments. The synthesis which such judgments involve has therefore *previously* been established. But suppose the case where some largely, or partially, *new* object is brought before the mind, whether in the form of a perception, or of an image of constructive imagination as guided by description (oral or written). There is then presented to the mind a problem which may be stated in the question, "What—is—it?" (this X). In answer to this question the demand is made for judgments that shall be statable in propositions, and shall end in a single judgment—namely, "It is A," or "It is B," a new conception with another name. The qualities of the new object, not simply as perceived, but as conceived or named, are thus mentally united in a new combination and a new name. *The essence of the logical judgment is, therefore, a juncture accomplished between conceptions or "condensed" results of past acts of judgment which are already familiar to us and have previously been fixed by names.*

The fact that the time occupied by any one field of consciousness is never infinitesimally small—that the real present is never a mathematical point, but is always an extension in time of a more or less manifold content of consciousness, is necessarily concerned in the process of judgment. Logical judgments, considered as syntheses of so-called conceptions made in propositional forms, could never take place if such were not the nature of our time-consciousness. Such judgments are certainly (they are even pre-eminently) *time-occupying processes* in the stream of

[1] As says Sully (The Human Mind, I., p. 434 f., note): "The expression is one of great ambiguity, and consequently not easily susceptible of exact definition."

consciousness. Here the sequence of words in every proposition is representative of a sequence in the conscious processes themselves. Both introspection and experiments in reaction-time (see p. 302 f.) demonstrate that this is so. If the "moment" represented by the subject-conception coincided perfectly with the "moment" represented by the predicate-conception, then there could be no judgment; for judging is a process in time. The proposition *A* is *B* requires some separation in the consciousness of *A* and of *B*. But if what is represented by *A* were passed entirely out of consciousness before what is represented by B appears in consciousness, then, too, there could be no judgment. For every judgment is a uniting process. Both the morphology of the conception and the morphology of the logical judgment require us therefore to regard the corresponding processes as mental growths. The growth of the logical judgment is, however, much less instantaneous, much more explicit, as it were, under the eye of the conscious subject. Figuratively speaking, we may say that *the synthesis of judgment is accomplished by a flow, in determinate direction, of the stream of consciousness, intelligently uniting two successive waves of this stream so that they belong together under the laws which govern the whole.*

(2) The forms of synthesis in logical judgment are limited by the number of those fundamental relations under which the terms of the judgment are capable of being synthesized. It belongs to logic to classify the so-called "predicaments," and to philosophy to discuss the "categories," rather than to descriptive psychology. By simple inspection of the different states of intellectual consciousness, however, we may note the following:

(*a*) Synthesis under terms of *resemblance* or *difference*. In judgments of this class we unite or refuse to unite two conceptions as embodied in language, because comparison shows to us either a sufficient or an insufficient amount of likeness. *Some* points of likeness must serve, however, as points of starting if we are to make serious work of any attempt, even to bring two conceptions together into a judgment. To judge, for example, that "an asymptote is not in the key of *A* minor" would be to "play the fool" with intellect rather than to use it. But points of observed, or known, or conjectured likeness or unlikeness are constantly changing as the work of intellect gains in elaboration; therefore judgments of this sort constantly change—and this, without necessarily implying change in knowledge of the truth, but only change in point of view or in the end to be served by judgment. Again, judgments respecting resemblance and difference may have to do either with quality or quantity. In the

latter case what is affirmed is likeness or unlikeness of amount—whether expressed arithmetically in numbers or geometrically in respect of space-extension. Identity, as affirmed of qualities and objects, and equality, as affirmed of quantities—psychologically considered—belong under this form of judgment. When it is said this quality (color red, pitch a ♯, feel of roughness, sentiment of kindness, or characteristic of a memory-image) is *identical* with the other, it is meant that the two are indistinguishably alike. But when it is said this object (ball, man, star, etc.) is the *same* as that I remember to have perceived previously, the judgment, besides affirming likeness, affirms also something metaphysical—a continuity of real existence, to which reference must be made in other connections.

(*b*) In certain judgments we synthesize conceptions under consciously recognized relations of *time* and *space*. For example, one event is declared to have followed another or to have preceded it; or two events are judged simultaneously. Objects of sense-presentation, or their representative images, may be united in acts of judgment under all the different relations which belong to extension in space. *A* is judged to be "below," "above," "inside of," "to the right" (or left) of *B*, etc. But in all such judgments there is involved not only a development of the conceptions of the events and objects thus related, as having temporal and spatial properties (enduring in time and extended in space); but also, of course, a development of time-consciousness and of space-consciousness by the same intellectual activities. Further light will therefore be thrown upon these judgments later on.

(*c*) Very early in the development of intellectual life appears an important but much neglected form of judgment, which attributes *action* to an *agent*. When, in the consciousness of the infant, the proposition, "The milk is hot," expresses a true judgment as distinguished from a mere association of representative images, it is this form which it assumes. Such a proposition does not so much mean, "That-thing-there-whose-name-is-milk has the quality of hotness," as "That-milk-there burns (or will burn) me." In fact, from the very beginnings of intellect onward, the judgment—"This or that person or thing is doing this or that" (behaving in a certain way, or affecting somehow another person or thing), may be said to be the predominating form of judgment. It is to this form that attention is attracted most strongly; and around its truth or falsehood our interests cluster most thickly. This fact is the analogue, in the higher regions of mental life, of the fundamental psycho-physical fact

that sensations of motion are relatively effective, even with low degrees of intensity (see p. 148 f.).

Out of this common root, in connection with the preceding forms, develop those judgments which may properly be called most "metaphysical" in their intent. Such are judgments of attribute affirmed or denied of a substance, judgments of cause and effect, and judgments of design adapted to an end. Even those judgments which are sometimes called "judgments of subordination," and in which species is brought under genus, and parts under the whole (whether with the scientific end of classification, or with the æsthetical end of a pleasing proportion), are largely dependent upon the development of this form of thinking. For every intellect knows itself as only active, as ever doing something, as ever effecting some change; and every intellect is necessarily (not that of the child or savage more truly than that of the man of science or the philosopher) anthropomorphic. *The intellect can understand the world only as a system of related beings which are ever—each one—doing something and having something done to them.*

§ 9. That judgment in this higher and secondary form enters into all perception, as soon as we learn the nature and the names of things, is not difficult to prove. Suppose, for example, that one sees not the familiar lion, tiger, or ox, but (for the first time and without knowing its name) a jaguar or a yak. On "minding" the former attentively—that is, on bringing its various perceptible characteristics under various conceptions already acquired—one judges that it is *like* the tiger, but is *not* the tiger—at any rate, as already known. It is whitish on the under side of the belly, but not so extensively as the tiger; it is of brownish-yellow above and striped faintly along the sides, but lacks the plainly marked black bars of the tiger and its bright orange-yellow ground. The results of such elaborate comparing activity may then be summed up in judgments answering the question, "What-is-it?" For example: This striped-moving-thing *is* an animal, is a quadruped; it is carnivorous and belongs to the genus *felis*, etc. And, finally, this carnivorous, feline animal, with all these obvious characteristics of color and form, is *named* a "jaguar." Or, again, this other animal (the yak) is *like*, but is *not*, the ox, as already known. But it is a ruminant mammal of bovine tribe; and its name (the word which will fix and hereafter hold the final synthesis of many judgments in a single judgment) is the "yak" or "grunting ox of Tartary." Now all three stages of judging activity are apt to be implied in such elaborate processes of perception, or series of perceptive processes as the foregoing, namely—the primary intellective acts of comparison, the acts explicating a little way, at least, the meaning of conceptions already formed, and the secondary judgments synthesizing old conceptions into new combinations. In such instances as the preceding, the perceiving intellect would undoubtedly indicate and support its synthesizing activity by propositions like the following: The animal is

particolored; it is striped on the sides and white beneath; it has carnivorous teeth and claws; its general aspect is feline, etc. At once and by immediate perception, we might say, this object is known as "animal;" presently, and with few and easy intervening judgments, it is known as colored, shaped, and striped, so and so; still later, and as the result of more thoughtful inspection, it is known as carnivorous and feline, and as differing in certain particulars from the tiger; and, finally, it is known as that carnivorous-mammal, etc., called a "jaguar." Now it is plainly the presence of a large amount of this definite and namable (or, if one please, "talkable") judgment that distinguishes such intellectual activity in the complex perception of new objects from the "intellection" that all discriminating consciousness, however meagre and vague, can claim to show.

§ 10. It is through such synthesis, by judgment, of conceptions already formed, into new conceptions, and then, of these into still higher and more complex forms, that *scientific knowledge* is gained. By judging, then, the body of knowledge, both perceptive and inferential, undergoes a growth. In order more fully to understand this matter, however, we must subsequently discuss the nature of inference or reasoning, and the nature of knowledge. The analytic judgments which explicate the conception are understood to tell what we have already learned as *true* concerning the nature of the objects to which the name of the class may be applied. But it is the synthesis of conceptions into new forms of combination by which knowledge grows.

§ 11. The meanings of the terms applied by logic to the different parts of the judgment, and to the kinds and potencies of judgments are all to be understood in the light of the foregoing remarks.

(*a*) There are three terms in the proposition, and these are subject, predicate, and copula. The "subject" is the term for that conception from which the synthesis in judging takes its point of starting; it is that of which the other conception is affirmed or denied. The "predicate" is the term for that conception which, following later in the stream of consciousness, is united by the synthesis of judgment with the subject. The "copula" is the term which signifies the act of synthesis itself.[1] In the actual use of language, as the expression and support of thought, and as well in the actual corresponding process of judging, the order of the terms is not fixed. In such cases of perceptive judgment as were mentioned above, it is the *predicate*, or property predicated, from which the repeated syntheses, for the most part, take their start. "What-is-it?"—this animal which looks like a tiger, but is not. "Striped," is it; "carnivorous," is it; "feline," is it; and "jaguar" is its name; such is the order, it is probable, in which the successive conscious syntheses really occur.

(*b*) The divisions, or kinds, of judgment may be determined either by the character of the relation established between the conceptions, or by the completeness (extension) with which we intend that the conceptions shall be understood. Under the first principle of division we have judgments of "quality and comparison," judgments of "quantity and proportion," judgments called "categorical," "hypothetical," and "disjunctive." Only the

[1] Says Bosanquet (Logic, I., p. 83): "The copula, which in judgment is merely the reference that marks predication, and has no separate content, becomes in the proposition an isolated part of speech."

last of these divisions needs a remark or two. A categorical judgment (*A* is *B*) is said to "affirm that one conception does or does not belong to another;" or "to affirm the predicate of the subject unconditionally;" or perhaps, better still, to "assert an actual fact absolutely." However we may choose to express the relation, it is plain that all "grounds" on which the judgment has been based, and all doubt over its modifying conditions are supposed to be left out of the proposition expressing the judgment. The hypothetical judgment (if *A* is *B*, then *C* is *D*) implies, on the contrary, a distinct reference to grounds, or a doubt as to conditions, or as to validity of the alleged case, etc. (Hence the form of the hypothetical judgment may also be: If *A* is, *B is;* or if *A* is *B*, then it is *b*.) But all reference to, or acquaintance with, the ground of our judgment is a matter of degrees; and so is doubt and its expression. Hence attention has often been called to the fact that the real meaning of our judgments may frequently be stated in either the categorical or the hypothetical proposition. For example, suppose it has rained recently and the question arises, "Is the grass wet?" (and so, do I need rubbers, or not?). Then the judgment uniformly occurring to the mind may be stated, either in the awkward way: "Grass rained-on is grass wet;" or, "If this grass has been rained on, then this grass is wet." Both these judgments involve reference to "grounds" of inference and to an act of reasoning from them; but one is categorical in form, and the other hypothetical.

By affirmative and negative judgments alike we recognize the true synthetical nature of all judgment. For by "negation" we do not mean the same mental process as that called "affirmation of difference." The negative judgment signifies the settlement of a doubt by a positive affirmation—a synthesis of conceptions, as truly as does the so-called affirmative judgment. The synthesis brings *A* and *B* together under the relation of difference; the negative proposition asserts the exclusion of *B* from *A*. As a writer of logic has truly said: "In fact, Negation *is* simply the *logical conscious* expression of difference."

What logicians call the "extension" of the conceptions used in the different judgments also may serve to classify the kinds of judgment. Hence the division into "Particular" (sometimes called "Singular") and "Universal;" or as combined with the principle of affirmation and denial, the forms of judgment may be arranged as follows:

All *X* is *Y;* contradicted by Some *X* is not *Y*.
No *X* is *Y;* " " Some *X* is *Y*.

[But for other details of these divisions reference must be made to treatises on logic.]

(*c*) By the "potencies" of judgments we mean what logicians have been accustomed to call "modality." This distinction has reference to the degree of certainty with which the judgment is made and maintained, "as being the *mode*, or measure, in which the mind holds it to be true." But like all questions of "degree," this question cannot be answered in terms of precise formulas; and, indeed, as a psychological inquiry it has rather to do with the manner in which different amounts of conviction, or belief, enter into the growth and structure of our entire system of knowledge so called.

§ 12. The manner in which the *time*-element of consciousness is related to the character of the judgment as a real act of synthesis, has been the subject of much debate. How—it is sometimes asked—can judgment take place, if the predicate-conception in the mental process must really follow the subject-conception, as the predicate term in the proposition certainly follows the subject-term? But how, on the other hand, it is also asked, can two conceptions co-exist in consciousness; and if they did co-exist, how could they be kept apart so as to form a true judgment? To these questions the only correct psychological answer emphasizes the undoubted fact that all judgment is itself a process—a peculiar character and ordering of the flowing stream of consciousness. This process is sometimes accomplished so rapidly that it resembles rather a sudden spring—a "leap to judgment." Sometimes, however, judgment takes place so slowly that we can discern the inner nature of that evolution of content, with its accompanying emphasis of assent, in which the process of judging consists. *The "growth of content," according to certain morphological laws, is characteristic of the nature of the process of judging.* Suppose, for example, that one is reading a certain description of any complex object and deciding, or making up one's mind, as to what it is. The series of judgments in which this decision will terminate itself consists of changes from one content of consciousness to another, with a constant accompaniment of conscious emphasis laid upon the relations between these changing contents. One judges this animal called a "yak" in the book one is reading to be "ruminant," "bovine," etc., as the different particular conceptions awakened by the description are followed by the vaguer and more highly universalized conception for which these names are already the familiar terms.

In general, then, we emphasize anew this conclusion: What logic calls "judgment" is nothing other than the *process itself of judging.* We continue to *speak as though there existed some timeless mental product to be called "a judgment," because we can repeat the process* (in however sketchy a manner, and by way of bare indication) *through which our knowledge of objects originated; and in the process itself we may distinguish the so-called conceptions that have fused in the judgment, in order to observe their immediate subsequent fusion.* For this process of judging, like all mental processes, is necessarily "in time."

The Relation of Language to Thought furnishes a theme[1] which may be approached from several points of view; prominent among these are the philological, the philosophical, and the psychological. It is, of course, the truth discovered from the last of these three points of view which primarily concerns us here. The general dependence of both spoken and written language upon the development of human faculty so called, and the important part which language itself plays in this development, are beyond doubt. But language is not the product of

[1] This discussion is introduced here rather than after the third stage of thinking—namely, reasoning—in order to bring it into closer relation with the formation and expression of conceptions or general notions.

any one faculty; nor is it a divine gift or a discovery which appeals to one faculty alone. So far as its origin and development can be explained, they are dependent upon the combined and harmonious action and evolution of various forms of mental life. In fine, it is scarcely too much to say that human language is the product of the entire manhood of man; and that, conversely, the assertion, preservation, and development of his *human* nature is largely involved in the use and growth of language.

It is, however, the intellect with its function of thought which feels the need of language peculiarly, so to speak, and this in various ways, to which reference will be made later on. It has therefore been customary to narrow the discussion of the relations between language and psychic life to the case of words and thoughts, considered as conceptions or "general notions." The psychological problem may then be stated in the following way: How far are general notions dependent upon words for their formation and expression? Connected with this problem are such subordinate inquiries as, Can any of the lower animals form general notions? To what states of consciousness do the common symbols employed by certain of the animals correspond?—and other similar inquiries. Such inquiries deal largely with matters of biology and comparative psychology; they therefore take us over very uncertain ground. All investigation of the consciousness of the lower animals, of its points of resemblance to, and difference from, our own, must always remain comparatively obscure. But especially with reference to such a question as the relation of thought to language, the uncertainties of comparative psychology are greatly increased by the difficulty of answering the similar question on the ground of human psychology. And until some definite views are attained by the scientific psychology of man, there is only confusion instead of clearer light to be gained by arguing from the other animals to the case of man.

Any inquiry into the general relation between thought and language depends, of course, upon the character of the phenomena to which we restrict our terms. Now the view already taken of the nature of thought compels us to recognize the important truth that language, as the vehicle of thought, must be favorably related both to the reproductive image-making part of thought, and also to that process of judgment, based upon comparison and ending in conception, which constitutes the more properly intellectual part of thought. The term "language" itself is, however, capable of a variety of meanings. By language may be understood any modification of the motor organism which is

adapted to serve as a "sign" or "symbol" of some corresponding state of consciousness. But unless different states of consciousness, and the different objects perceived or remembered or imagined in them, were so similar in the different cases, not only of the same individual's psychic life, but also of different individuals of the same species, that their differences could be disregarded, it would not be possible to "signify" them by means of any *common* symbol. Similar modifications of the motor organism do, however, naturally go with similar states of consciousness; indeed, we have repeatedly found reason for supposing that processes of sensation, ideation, feeling, or intellection, cannot be realized without involving corresponding modifications of consciousness on the side of action, and of the motor organism. Language may then, in some sort, be said to be employed whenever the modifications of the motor organism evoked become of so fixed and general a character as to serve the purposes of recognition of similar past experiences—whether to the individual whose organism is moved, or to others. In man's case, for obvious reasons, such purposes are ordinarily served only through two of the senses—hearing and sight. Thus the customary "sign," or "symbol," makes an appeal for recognition to the ear, or to the eye, as something heard or seen. But for many of the animals such appeal, if made at all, is made chiefly or wholly to the sense of touch; and this is eminently possible, though not convenient, in the case of man.

Just as the transitions from the less to the more abstract ideas, and from the lower to the higher forms of thinking, are gradual and subjected to the laws of development, so is it with the transition from the foregoing use of language to that which is more peculiarly characteristic of human reason so called. Hence we discover certain stages of the evolution of both thought and language, in their intimate natural relation with different individuals and different races. But even if more complete data for tracing the history of the subject in every human soul and in the entire race of men were available, the same difficulty would probably be found in drawing exact lines of demarcation. It may fairly be said, however, that *in the narrower use of the term, language begins whenever modifications of the motor organism become generally accepted* (or "conventional") *as signs for the recognition of similar experiences* (objects, or actions, or relations—whether of sense-perception or of self-consciousness) *as the same.* But now the special relation of language to thought and its product—the so-called general notion—is at once apparent. As one peculiar excellence of man's mental evolution

consists in the extent (as respects both refinement and comprehensiveness) to which the thinking processes are carried, so the peculiar corresponding excellence which makes language possible for him consists in the superior development of the vocal and auditory organs. In this system of vocal and auditory organs the central nervous apparatus connected with the elaborate equipment of end-organs must, of course, be included. Man's language is pre-eminently one of words; and "the word," primarily, is something *spoken* to be heard. But the limitations which time and space set to the functions of hearing favor a subsequent appeal to the eye for recognition of that form of the sign and vehicle of thought which constitutes the *written* or *printed* word. Since, however, the principal relations of spoken words to processes of conceptual judgment cover all the more important relations of language and thought, we shall confine ourselves to this aspect of the inquiry.

§ 13. Phrenology, philology, and psychology have wasted no little time in discussion of the "faculty of language." But modern cerebral physiology and experimental, as well as introspective, psychology make plain the absurdity of even talking about the existence of such *a faculty*. The early observers [1] of the phenomena of aphasia (or those disturbances of the functions employed in speaking or writing articulate language that are due to cerebral lesions) did indeed speak of "a faculty of speech;" they attempted to localize this faculty in circumscribed areas of the cerebral convolutions. It is now known beyond dispute, however, that human speech involves, in a complicated and large way, a very considerable part, if not the whole, of the hemispheres of the brain.[2] The four principal recognized types of aphasia—namely, (1) motor, or inability to utter sounds with meaning; (2) agraphia, or inability to write signs that have meaning; (3) word-deafness, or inability to appreciate the meaning of spoken words; and (4) word-blindness, or inability to read signs, by the eye, that have meaning—doubtless involve specially localized forms of the general difficulty. But they all also involve impairments of the complex activities in particular directions of expression; as, for example, hearing *words*, seeing *words*, moving the vocal organs to utter *words*, etc. The importance of the integrity of the association-tracts between the so-called cerebral centers, and of the soundness of the whole brain, as connected with general intellectual functions, are further made apparent by the same scientific researches. The old phrenological view, which advocated a special "bump" of language corresponding to a fictitious "faculty" of language, has thus been rendered completely untenable.

What the physiology of the brain suggests, the study of the psychology of speech confirms. Those refinements of the perceptions of the eye and ear, of which man alone is capable, are necessary to his use of written and

[1] For example, Broca: Sur le Siège de la Faculté du Langage articulé, etc. (1861).

[2] Compare the author's Elements of Physiological Psychology, p. 991 ff., and the works cited there; also articles by Drs. Mills and Starr, Brain, 1889.

spoken language. In the opinion of Lotze,[1] defects in these directions would alone prevent the lower animals (for example, birds that can imitate some of our words) from developing speech: "(1st) Defective sense of hearing; and (2d) want of an organically constituted harmony between the mental images of sound and the muscular movements that are requisite for the production of sounds." Man's superiority with respect to those sensations and images of sensations which are necessary to the use of language, constitutes, then, a part of his faculty of language. But particularly would a lack of imagination and recognitive memory, in its higher form, be unfavorable to the origin and development of speech. It is, however, as has already been indicated, the superiority of man's intellect, as judging and reasoning faculty, which both requires language in the form of "movable types" and also makes it possible. All the principal forms of mental life on its sides of sensation, imagination, and intellection, are therefore concerned in the states of consciousness correlated with speech.

§ 14. The psychological origin of language is not to be found in our need to express the results of so-called abstract thinking alone. The rather is the more primary source of language, in the broader of its meanings, to be found in the affective consciousness. Here, in the realm of feeling, lie the springs of that necessity for, and tendency toward, expression which all the higher animals so plainly exhibit. In many of their particular forms of expression the relation between feeling and its sign is immediate and organic. In this relation are fixed the roots of "natural language," so called. This will appear more clearly when we come to discuss the nature of the emotions. But, in general, that semi-chaotic surplus of cerebral excitement in which the physiological basis of feeling was held to consist naturally overflows, in man's case, in the various forms of vocalization. Thus it has been claimed that the point of starting for human speech is to be found in the greater impressibility of man in his wild state to all manner of sensations with their strong affective accompaniments (some of which may be unknown to us).[2] Man's easy and appropriate "gesture" under the influence of any strong feeling is to open his mouth and emit some correspondingly modulated sound. "Speaking is the instinct of man; man builds speech, as the bird its nest." But such instinctive sound (*Laut*) is not as yet a "Word" (*Wort*).

On the basis of such rich utterances of expressive sound as man's varied life of sensation, motion, and feeling makes possible, Language as the Vehicle of Thought is constructed. Here a mere reference to the real nature of the thought-processes will suffice to furnish the key to a true explanation. The sound becomes a word, the unorganized variety of natural vocal symbols becomes a system of words—a language—by modifications received through the activities of ideation and judgment. *These* are the activities, however, in which thought consists. The goal reached in this way is the formation and expression of so-called

[1] Microcosmus, I., p. 606 f.
[2] Comp. Volkmann: Lehrbuch d. Psychologie, I., p. 333 f.

conceptions, or general notions. Thus arises the change from natural sounds to speech as the expression and vehicle of conceptions.

In all development of language the relation of the utterance to the image in its various stages [1] of abstraction is most important. When the representative images of those experiences which have previously excited expressive sounds recur in consciousness, their former emotional accompaniments are, of course, largely wanting. The sounds themselves—when reproduced as mental images of sounds—lose their former connection with the feelings that called them forth; they thus become better adapted for the conveyance or translation, not of feelings in connection with presentations simply, but rather of ideas. And as the process of abstraction modifies the ideas, and they become "freed" from the concrete and vivid details of their more original character, the vocal symbols become, on their part, adapted to represent the changed character of the ideas. But *speech as the correlate of genuine or conceptual thinking* (the word as the support and vehicle of the general notion) *is achieved only when the sounds acquire recognition as conventional "movable types."* In achieving this not only a very close relation, but even a pretty strict interdependence, between conceptions and words, between language and thought proper, must undoubtedly be recognized. This mutual dependence, however, is itself due to the fact that, for the great majority of men, oral expression of conceptions has become the established form of symbolism. For deaf-mutes, of course, some other established conventional forms of motor activity, which may act as movable types, are necessary. What is necessary in all cases, for any considerable development of conceptual thinking, is the use of *some* form of motor activity which may serve the purpose of a system of such movable types.

In all cases where the intellectual processes issue in the formation of a genuine conception, it is the giving of a *name* which, on the one hand, so fixes for the individual using it the mental act of synthesis as to make its results capable of recall, and, on the other hand, serves as the means of awakening corresponding intellectual processes in others. But this is the same thing as to say: *the name is the support and the vehicle of the conception.* If we raise the question as to how the name thus operates, we can answer it psychologically only by rehearsing the same men-

[1] Here stages cannot be distinctly marked off so as to form classes of ideas. Strümpell, however enumerates four grades of ideation: (1) *Gesammtvorstellung*; (2) *Allgemeinvorstellung*; (3) *Begriff*; (4) *Idee.*

tal processes which terminate in giving the name, and which are reproduced by thinking out the meaning of the name. For human beings who are capable of learning to speak, and who have actually learned to speak, words are the indispensable support and vehicle of their truly conceptual thinking. Without words, thinking lapses into a mere succession of acts of image-making; or else it awkwardly strives to substitute for its natural and facile correlate some other form of motor activity. That is to say, without words thinking either ceases to be *thinking*, or else it adopts some other less useful form of a movable type.

§ 15. The connected questions, how far the lower animals are capable of forming conceptions, properly so called, and how far they can use any form of symbol as a "movable type," have a certain value in studying the psychology of thought. These are, however, difficult questions to answer with any great degree of confidence. Romanes,[1] after a detailed discussion of the subject, reaches the conclusion that some animals, at least, are capable of forming "recepts" (*i.e.*, rather highly abstract representative images—*Gesammtbilder*); but they cannot form "conceptions," or general notions, in the stricter sense of these terms. As to the second question the same writer concludes: "that the verbal signs used by talking birds are due to association and to association only, all the evidence I have met with goes to prove." The lower animals cannot, he thinks, use words as movable types. These two conclusions, of course, hang together. For a word, or other symbol, is used as a *movable type* only when it serves to mark the synthesis of conceptual thinking, which brings together the individuals under a general, or class, notion. It is to the notion that the word answers as a movable type; for it may equally well be applied to any one of the objects already known as having the characteristics of the class, or to any new object of presentation or imagination which has the same characteristics. *The name signifies a series of judgments synthesizing many similars as—thought-wise—the same.*

However far we may be induced to go in our explanation of the wonderful sayings of parrots, or the actions of dogs and other highly intelligent animals, the early performances of many children surpass almost immeasurably anything that the most intelligent animals can do. For example, M. Taine tells of an infant of eighteen months who had played hide and seek with her mother, calling out, "*Coucou;*" and who had also been told when her food was too hot, or the sun was very warm, or the candle too near, etc., "*Ça brûle.*" On first seeing the setting sun suddenly disappear behind a hill, she cried out, "*A b'ûle coucou.*" Here finished acts of conceptual thinking supported and expressed by language are indubitable. "That-which-burns" is one conception; "that-which-suddenly-disappears," as one who calls out in playing hide-and-seek, is another conception; the two are united in a judgment applying to an entirely new and unexpected event. Yet more did the sage little boy of whom M. Perez tells, and who remarked of certain insects: "Generally" (*N. B.*, the word)—"generally, but not always those

[1] Mental Evolution in Animals: comp. Mental Evolution in Man, especially chaps. iii.-ix.

insects light on the leaves," surpass in conception and thought, *toto cœlo*, the most wonderful performances of all the animals.[1]

§ 16. The amount of thought proper implied in any particular word, or system of words, varies indefinitely with different individuals and races of men. Indeed, this is a matter which involves both inclination and ability. Lazarus[2] has acutely remarked upon the great difference of individual men, in their inclination to form genuine concepts; and he declares of such a concept as that corresponding—for example—to the word "Bible," that while "the whole is thought as a kind of collective thought-content," it has "hovering" and "flitting" around it, as it were, a throng of vaguely ideated particulars. Experiment with groups of persons, having in view to bring out the different conscious processes evoked by the same word, shows remarkable differences in this regard (comp. p. 443 f.). It is matter of common observation that some persons are far more *thoughtful* than others in the use and appreciation of words; still others excel in the vivid imaginative content evoked and expressed by the language they employ. The same differences characterize races of men and stages in the development of language. Of Hebrew and the Shemitic languages generally, the qualities of sensuousness and concrete imaginativeness, as distinguished from conceptual excellence, may be affirmed. Hence the predominance of the verb and of verbal elements gives a pervasive vitality to all their sentences. Anger, for example, is "hard-breathing," "tumult of boiling," "noise of breaking," "trembling," etc. The "substance" of anything is its "bone." As Renan says: "This primitive union of sensation and idea is always preserved." It has, furthermore, been pointed out by students of language that races backward in intellectual development show a corresponding deficiency in general names. Thus among the North American Indians a term sufficiently general to denote a species like the oak-tree is seldom found; and the Tasmanians are said to call the quality of "hardness," "like-a-stone," and a tall thing or man is declared to have "long-legs." On the contrary, the child, in using names already prepared for him by the development of the community often applies the general term inappropriately to some object which needs a more particular denomination. Thus he may use the words "papa" or "mama" as names for the male or female sex, respectively. Essentially the same deficiency in the attainments of conceptual thinking and a correspondingly undeveloped use of language are testified to in all such cases. For the culture of the relating activity generally requires both the noticing and marking, by names, of the more minute and complex distinctions of objects, and also the grasping together under general notions, and their names, of larger and larger groups of objects. Here, again, reasoning, as the yet more highly elaborate form of thought, needs to be considered. This topic follows presently.

§ 17. With most men at all times, and with all men frequently, words largely take the place of actual thought-processes. Thus the succession of symbols does something more than to *aid* thinking; it becomes an almost or quite complete *substitute* for thinking. How this can be, has already been

[1] Comp. Prof. James's stories and his acute analysis of them. The Principles of Psychology, II., p. 349 f.

[2] Das Leben d. Seele, III., p. 234.

explained in treating of the fusion and condensation of the processes of conception and judgment. It would doubtless be an exaggeration to affirm that the whole of any one's life may be condensed into a properly emphasized word; yet the exaggeration would carry with it a certain important truth. What one talks over with one's self, together with the way one says it to one's self, furnishes excellent *indiciæ* of the results of past thinking-processes, with their habitual affective accompaniments. For the inner word is not mere talk; the rather does it embody and convey to the talker himself the resultant of much previous combined activity of presentation, memory, imagination, conception, and will. Hence we find men using "pet" phrases that are indicative of judgments formed, and feelings felt, habitually and long ago. Moreover, the standard arrangements and collocations of words are determinative of the thoughts of the man who accepts and uses them. They represent results of previous conceptual thinking on the part of the race, structurally established and organically propagated, as it were. So that the individual who uses, for example, the classic Greek or the modern German or English language, is compelled, in some sort to "think up" to the language he uses. And yet, as for thinking his way into a thorough and intelligently appreciative use—this is what exceedingly few heirs to so rich an inheritance of racial conquests are capable of doing, or indeed make any effort to do.

§ 18. The difficult question as to how ".roots" originate is philological rather than psychological. It may be said, however, that the psycho-physical and intellectual equipment of man, is quite adequate to this work. That such sounds do originate in the bare effort to fix and communicate the results of conception, experience abundantly proves. Why they are, individually, just so shaped as they are—that is, the particular psychological history of the origin of each word—can by no means always be given. Thus a child of less than five years of age was heard to ask her mother: "Why do you *spranken* your eyes so?" This term appeared as a pure invention to designate a peculiar complex movement of the organs of vision. In similar manner have many of the roots of the existing languages been invented.

§ 19. The relation of language to judgment needs no separate treatment from our present point of view; for the grammatical form of the judgment is not important in determining its psychological import as a synthesis of conceptions. Genuine judgments—especially those of perception—may indeed be expressed in single words. Such grammatical "fusion" of subject, copula, and predicate, in one word, is psychologically significant. It indicates the truth, anew, that all thinking is essentially one in kind; and that the process of judging is the essential process of that one kind. For example, if one of several persons all alike interested in the day's weather utter the word, "Rain!" then according to his intonation he will be understood as judging—"The rain is falling yonder;" or "The rain will surely soon fall here;" or "I fear it may probably or possibly rain," etc. The "leap" of the mind to judgment may be embodied and expressed in a single sound; and not only so, but also the grounds on which, as a species of reasoning, this leap supports itself.

[On Conception and Judgment consult: Ward: art. Psychology in Encyc. Brit. Hamilton: Metaphysics, lect. xxxiv. Taine: De l'Intelligence. Rabier: Leçons, etc., I., Psy-

chologie, p. 399 f. Lipps: Grundtatsachen d. Seelenlebens, chap. xx. George: Lehrbuch d. Psychologie, p. 463 f. Waitz: Lehrbuch d. Psychologie, §§ 48, 49. Lazarus: Leben d. Seele, iii., 1 (*Der Tact*). Volkmann: Lehrbuch d. Psychologie, II., p. 241 f.; and various works on Logic of which the following are especially worthy of mention: Bosanquet, the entire vol. I. Venn: Empirical Logic, chaps. i.-x. Lotze: Logic, i., 1, and Microcosmus, Book v., 8. Sigwart: Logik, §§ 40–44 and 75–78. Bradley: Principles of Logic, I. Ueberweg: System of Logic, i. and iv. Trendelenburg: Logische Untersuchungen, § 15. Wundt: Logik, I., ii. On the Relation of Language to Thought, see Whitney: Language and the Study of Language. Steinthal: Abriss d. Sprachwissenschaft. Sayce: Introduction to the Science of Language. Fr. Müller: Grundriss d. Sprachwissenschaft. Preyer: The Mind of the Child. Peres: First Three Years of Childhood, pp. 236–264.]

CHAPTER XX.

REASONING

THAT some sort of Inference, or Drawing of Conclusions from signs which serve as "reasons" for them, enters largely into experience, we have already found abundant occasion to know. Such an effect follows, as a matter of course, from the unity in essential characteristics of the various stages of the thought-processes. The statement is further verified by the facts of analysis—even as they are expressed in the language of daily life. In any case of perception where doubt arises, or even where the bare chance for "reasonable" doubt may be surmised, we stand ready to answer the question, "Why?" or "On what grounds?" But this fact distinctly shows that the perception itself involves a sort of reasoning process. For example, I sum up the results of a perfectly clear and completed act of sensuous presentation, in the affirmation: "I heard the fire-bell strike fifty-four just now." Such an affirmation ordinarily would not be called in question, but accepted as a matter of so-called "immediate knowledge." Suppose, however, that my conclusion from this perception is announced in the following terms: "There is a fire near the corner of A and B Streets." Then plainly the question is most pertinent, if not even demanded: "How do you know that there is a fire in that place?" To this question the answer, of course, would be: "By the list of fire-stations, which has the No. 54 opposite the words 'corner of A and B Sts.'" But here certainly is a case of reasoning; since the *two* judgments, "The fire-bell strikes 54," and "The striking of 54 by the fire-bell means fire near the corner of A and B Sts.," have contributed together to the third judgment: "There is now a fire near the corner," etc.

Suppose, however, that we return to the original perception and, for some reason or other, call upon it to give an account of itself. This so-called information, "I heard the fire-bell strike fifty-four just now," itself results from a series of acts of perception which may reasonably be regarded as affording the

ground for the concluding judgment. Of this "concluding" (*N.B.* the significance of the word) judgment, such questions as follow may be asked: How do you know that the sounds you just heard were those of the fire-bell (of a *bell* at all, and of the *fire*-bell in particular)? and, How do you know that the number fifty-four, and not some other number, was struck? To the first question the obvious answer is: Because I am already familiar with the intensity, timbre, and direction of sounds that have previously, *on good grounds*, been ascribed to the fire-bell as their cause; now, these present sounds are like those; therefore, etc. To the second question the obvious answer is: Because I counted the number of strokes, "five," then experienced a longer pause of the sounds, and then again counted the number of strokes, "four;" and this series of sounds, nine in number, and so arranged as respects interval, I am already familiar with as "signifying" 54. But here again it is plain that both the main kinds of reasoning—deduction and induction—are, in some sort, involved in the series of thoughts by which this concluding judgment is reached. Indeed, any logician might draw out such an experience into a very pretty exhibition of his pet syllogistic formulas. For example: All sounds which have the complex characteristics of intensity, timbre, direction, $= (i + t + d)$, are sounds of the fire-bell (*All* $S = (i + t + d)$ is *F. B.*). This particular case (C) of a series of sounds which I just heard had these complex characteristics (*This* ($s^1 . s^2 . s^3 . s^4 . s^5$——$s^1 . s^2 . s^3 . s^4$) is a case of repeated $(i + t + d)$ or S). Therefore this case is that of the fire-bell (C *is F. B.*). Such reasoning by deduction, however, involves an act of counting, and all counting is a sort of induction by simple enumeration.

Plainly, however, so clear and undoubted a perception as that of the striking of the fire-bell nine times would not ordinarily be considered a case of complex deductive and inductive reasoning. Plainly, too, the reason for the failure to recognize the original logical processes really involved in this act of perception is to be found in the speed and ease which previous experience has imparted to them. Here again, then, is an example of essentially the same kind of fusion and condensation of the results of past thinking as that with which the doctrine of conception and judgment has already made us familiar. But what is necessary in order to distinguish genuine logical reasoning from such so-called "instinctive" or "unconscious" reasoning? It is chiefly necessary that the intellect should, as it were, become conscious of itself. The thinking subject reaches *genuine logical inference whenever two judgments are related in such*

manner that one is made the "reason" or "ground" of the other, with a consciousness of the relation thus established between them.

§ 1. How the presence of question or doubt emphasizes the fact that reasoning enters into our perception by the senses, may be illustrated by innumerable experiences. It appeared in the previous chapter that the affirmation, "I hear a carriage," does really express a judgment of perception, even if there be no question as to whether it may not be a cart rather than a carriage which I hear (see p. 439). It may now be said that, in case of such question or doubt arising, the judgment which solves the doubt or answers the question, is capable of being regarded as a conclusion based on grounds. The same mental attitude occurs whenever we *pause*, as it were, in the presence of any series of sensation-complexes and "make up our mind" as to what is the meaning of it all. For example: Is this noise the ticking of the watch under my pillow, or the click of my heart-valves; is it the singing of a cricket on the window-sill, or the ringing produced by cerebral excitement in my ears? Indeed, *in all cases of the perception of unfamiliar objects, the activity which prepares for the final synthesis of naming, is a conclusion reached by reasoning.* Thus the natives of the Pacific Islands reasoned their way to the conclusion that the goats which Captain Cook brought to them were "horned hogs;" and that the horse was a "large dog." *As such* they perceived them. Thus, too, every student of the varied forms of plant and animal life carries about with him, in his perceptive brain and mind, as it were, a system of well-reasoned conclusions, condensed into familiar names of species, genera, etc. Whenever he perceives any new and unfamiliar sort of plant or animal, by a series of intellectual processes involving more or less of genuine ratiocination, he "concludes" them under some already established species, or under another species which he has the honor of being first to name.

Not only in perception, but also in memory, do we reason ourselves into the clearness of reproductive ideation, and into the accompanying conviction that recognition brings. Here, too, numberless questionings and doubts arise—either as between the memories of different persons or in the mind of the individual, as to which one of several complex representative images shall receive the seal of conviction. Was it yesterday, or the day before, on which we met *A*; and was it at the place *X*, or at the place *Y*, that we met him? All such *questions of correct recognitive memory require an appeal to thought in the form of more or less elaborate ratiocination.* Nothing is, indeed, more familiar than the effect of supporting memory by an appeal to other memory as its ground. But where such an appeal is consciously made, it involves processes of genuine logical thinking that proceed from premises to conclusion. And by condensation of these processes the conclusions of similar past processes enter into what appears under the guise of our most immediate knowledge. Nor is the same use of elaborate argument wholly lacking in support of the work of constructive imagination. "When I have saved enough money, then and *therefore* shall I buy me a new gown and take great pleasure therein,"—reasoned the imaginative milkmaid. The highest flight of the most purely "creative" artistic imagination requires for its success that it shall alight frequently upon the stepping-

stones of a "therefore" or a "because." Indeed, it is characteristic of the *highest* forms of imagination that they are, in some large degree, distinctly reasonable; while the chief office of scientific and philosophic imagination is to devise grounds and middle terms, in order that the "leap" to hypothesis may not be beyond the realm of the provable. In this connection we may refer to Schopenhauer's view, that the syllogism is chiefly *felt*.

§ 2. Nevertheless, the character of that kind of reasoning which stands in the same relation to our more purely perceptive experience as that in which our logical judgment stands to the same experience, is itself distinctly logical. As such judgment involves a conscious synthesis, or bringing into relation of conceptions (themselves the embodied and named resultants of other more primary intellectual processes); so *does genuine logical reasoning involve the conscious establishment of a recognized relation between logical judgments.* Thus, in order to reason, in the higher meaning of the word, I must be aware that my concluding judgment "depends on" other judgment as its *reason* or *ground.* Hence all reasoning implies a development of self-conscious mental life—all around, as it were.

The foregoing distinction throws needed light upon the question as to how far the lower animals are capable of acts of genuine reasoning. There can be no doubt that many of their performances simulate highly elaborate forms of ratiocination. But even the mechanism of the insectivorous orchids, or the spinal cord of a decapitated frog does this; and the world of the lower forms of life, of the infusoria, etc., is full of specious acts of reasoning.[1] Indeed, the entire field of animal instinct and of human tact is extremely difficult to mark off from that which gives obvious tokens of intellectual processes resembling those of perceptive inference. Many of the more intelligent animals, within limits not easy to assign, shrewdly vary the means at their disposal in adaptation to ends that seem to offer new problems for solution. These animals are plainly capable of recognitive perception and of intelligent expectation of results that the human intellect would infer as sure to follow from familiar causes. It is true, as Leibnitz says, that "in a new juncture which appears similar to the preceding, they expect anew what they found conjoined with it before, as if things were linked together in fact because their images are in memory." But this is the very thing, as Leibnitz himself goes on to say, which reason itself counsels men to do. It is the shock of surprise at being disappointed in expectation which awakens both man and brute to a process of inquiry and of reasoning. Whether, however, even the most intelligent of the lower animals ever reasons—in the meaning of drawing a conclusion from grounds with a consciousness of the nature of this peculiar connection thus established by the relating activity—is quite another question. For example, and to put the case concretely: Does the learned dog which, when it wishes to induce its master to go out for a walk, brings the umbrella, if it is raining, but brings the cane if it is fair, have in the stream of its consciousness any experience corresponding to this language: "The umbrella is the proper thing *because* it is raining;" or, "since it is fair, *therefore* only the cane will be needed?"

We shall perhaps never be able to answer such questions as the foregoing

[1] See Binet: The Psychic Life of Micro-organisms.

with a complete confidence. But a negative answer seems much the more probable, so far as any answer at all is justifiable. For conceptual thinking and its correlated development of language are necessary for the processes of logical inference; and these appear to be quite beyond the intellect of the lower animals. Here, to multiply instances of the most wonderful intelligence only increases our scepticism. For example, the spider of which Mr. Romanes, borrowing the instance from Mr. Larkin, tells us,[1] and which employed an ingenious and elaborate system of guy-ropes and haulings to raise a fly that was too heavy for a dead-lift, *acted like* an intelligent human being well versed in mechanical engineering. But to believe that the spider *went through conscious processes* like those of a mechanical engineer in solving a similar problem, taxes our credulity quite too severely. In general, beyond a certain limit, the more the deed seems to require of genuine logical inference, the less inclined we are to admit that there is really any *such* inference. The trouble, for the cautious psychologist, with the most startling instances of reasoning on the part of the lower animals, is that they prove altogether too much (if anything to the point) to be trusted at all.

§ 3. The next important consideration bearing on the psychology of reasoning may be introduced by citing from several authors. One writer[2] affirms that every conclusion is, psychologically considered, a judgment which takes place "through a mean," united with "a consciousness of this mediation." Hence the concluding judgment necessarily falls into two divisions; for sometimes the concluding proposition is developed only by opposition, although in such a way as to show that it was mentally accepted before the premises for it were sought. Another writer[3] regards "the conclusion" as the result of a delayed (or, for a time, inhibited) fusion of two judgments. The psychological reason why the judgments do not fuse at once is this: the middle conception which appears in the two premises can be, logically, only a single conception (otherwise the conclusion would be incorrect); but the total psychical picture in one of the premises is different from that in the other premise. A delay is therefore necessary until the consciousness of that "oneness," which is in "the two," can be developed. For example, suppose the conclusion to be reached is in answer to the problem, whether the crocodile is a mammal or not. But I now learn that the crocodile is "a cold-blooded animal," and I also remember that all mammals are "warm-blooded animals;" the conclusion therefore follows, that the crocodile is not a mammal. [The principle is the same, although the conclusion is in this case negative. One psychical picture is that of "warm-blooded mammal," the other is that of "not-warm-blooded crocodile;" and the middle conception is "warm-blooded." Now the fusion of the two judgments, delayed at first in order that inspection of the common contents of the two may take place, ends in a permanent inhibition of the fusion of the conceptions crocodile and mammal.] Again, still a third author[4] de-

[1] Mental Evolution in Man, p. 68; and comp. Science, No. 58.

[2] Volkmann, Lehrbuch d. Psychologie, II., p 269. Volkmann not only affirms that the *Enthymeme* is the natural and ordinary form of conclusion; but that, however logic may prefer the "first figure," thinking left to itself naturally takes the logically horrible "fourth figure" as its accustomed form.

[3] Ballauf, Elemente d. Psychologie, p. 135.

[4] Binet, Psychologie du Raisonnement, pp. 136 f., 141 f.

clares that "to reason is to establish new associations after the pattern of associations already made;" or, more completely: "Reasoning is the establishment of an association between two states of consciousness, by means of an intermediate state of consciousness which resembles the first state, which is associated with the second, and which, on fusing with the first, associates it with the second." In the line of the last remark is the declaration of Boole, that "reasoning is the elimination of the middle term, in a system that has three terms."

The essential truth of all the foregoing ways of viewing the nature of the process of logical inference, is better stated in the terms we have already employed. But there is one essential point which these authors emphasize, that has thus far been only implied in our discussion.

The question now arises, if all logical conclusion involves the relating of judgments *with a consciousness of their relation*, and if the essence of this relation is such that one of the judgments shall "follow from," or "depend upon," other judgment as having in the latter its *reason* or *ground;* What is meant by this very relation? What is it to be the "Reason" from which a conclusion follows; or the "Ground" on which it depends? On referring to the views cited in the last article, they are all found to emphasize the "middle term." Indeed, these authors speak as though the use of a middle term were the essential thing in reasoning. To draw a conclusion—they seem to imply—is to effect a synthesis between one conception, on which attention is fastened as the subject (S), and a second conception concerning which the question may be raised, whether it shall be attributed to, or predicated (P) of this subject, *through a third conception as means* (M). That is to say,—S is concluded to be P, or P is concluded to belong to S, etc., through M. This relation, thus mediated, may be stated in any one of several ways: S is (or is not) P, *because* it is (or is not) M; or, If S is M, then it is also P (why? *because* M is P); or M is P and S is M, *therefore* S is P—the last being the regular syllogistic form of the First Figure, as recognized by logicians. But all these ways of stating this relation seem alike to imply a problem or question—namely, Whether P does, or does not, belong to S—which is solved by our finding some M that can, as it were, mediate between S and P. Thus, as the result of one's reasoning which concludes with the affirmation or denial of a relation of synthesis, of some sort, between S and P, one knows S the better through M; for the latter has served as a medium, or "middle term," in the solution of the problem. Thus far we have only been stating a fact: *the reason or ground of every conclusion resides in the premises* (judgment or judgments from which

one concludes) *only as these premises contain some mediating conception.* But the mere statement of this fact does not answer the question as to what *it is* to be a reason or ground. When, then, psychology simply talks about "middle terms," as though they contained the secret of that procedure of intellect in which logical reasoning consists, it is quite too easily satisfied with the vague and empty terminology of formal logic.

Logical reasoning has been seen to require the use of a middle term, with a consciousness of the relations existing between this middle term and both the subject and the predicate of the conclusion. Thus reasoning does with judgments, what judgment does with conceptions. Mere judgment implies the synthesis of conceptions under conscious terms of relation. But every act of logical reasoning, when we bring its process out into full consciousness, implies a synthesis of judgments (*i.e.*, a consideration of judgments apart, as it were, a discovery of the possibility of their results being condensed into one judgment; and an actual juncture accomplished between them, through *something* belonging to both *in common*). This "something common" is obviously the conception which serves as the middle term. So far, however, as the essential psychological characteristics of the intellectual process of ratiocination are concerned, it is the words with which the conclusion is drawn (the "illative" terms rather than the middle term) that most clearly reveal the truth. These are the words "because," "therefore," and the like. It is in the import of these words that psychology takes most interest. The moment this important fact is recognized, it becomes evident that genuine reasoning implies something psychologically new, as it were, of the greatest importance in the development of mental life. For, all that acquired knowledge—especially of things remote in time or space — which we call science, as distinguished from mere opinion or vague belief, is dependent upon reasoning for its acquirement. Whatever the lower animals do, or do not, have in common with man, whether by way of actual attainment or in the form of capacity for attainment, they certainly have achieved no development of science. So far, then, as intellect proper is the necessary precondition of scientific development, it is this power of drawing, examining, and testing, defending and extending, or rejecting, logical conclusions, which differences man from all the lower animals.

But the very words "because," "therefore," and the like, themselves have no content except that which is acquired in the course of experience by processes of conception, judgment, etc. This is, of course, as true of these words as it is true of all words.

It is even pre-eminently true of such words as these, because of their highly abstract character and consequently late intelligent use. Indeed, the conceptions which answer to these words are never very clearly formed by the great majority of mankind. Most men do not clearly know, and cannot at all tell, what they mean when they affirm that one thing is so, *because* another is so; or when they parade a "therefore" in proof of some judgment at which they have—perhaps incontinently—arrived. These words must then be received by descriptive psychology as significant of a natural law of the intellect—as expressing a form of the action and development of man as a so-called "reasoning" or "logical" animal. The nature of this action and development signified by the words will be further explained, as itself a phenomenon of conscious mental life, later on.[1] But for the fuller understanding of this subject, psychology must refer to philosophy in its branches of metaphysics and theory of knowledge.

Certain remarks on the more obvious aspects of that bond between different judgments, which is effected by the middle term and which is essentially expressed in the terms called "illative," are in place here: (1) These terms imply that objects of experience *are* actually related in a great variety of directions, and under several main classes of relations. Objects are known as related directly, and in ways which perception can easily discover; but they are also known as related in more complicated and obscure ways; they are known as related *through* each other in an indefinite and incalculable number of directions. (2) Knowledge itself, so far as its entire inferential branch is chiefly concerned, consists in the apprehension of relations. Nothing can be known as unrelated; and, as has been habitually declared by psychologists, "to know is to relate." [This is, however, as we shall see subsequently, far from being all that knowledge is.] (3) A sort of instinctive impulse of the intellectual order, and a dim apprehension of the great supreme fact of the case, are implied in that natural and habitual mode of movement which intellect shows, as soon as the faculty of reasoning develops. Reasoning implies that, somehow, things generally are united into a system; and that this system is such as to make it possible for thought to reach from object to object, and from event to event, and to bind all the individuals into higher and yet higher unities. As to the ultimate origin and extra-mental validity of this presupposition of the logical process of reasoning, and even as to its justification and application in the lines of the differ-

[1] That is, in the latter part of this chapter, in the two following chapters, and by way of indirect reference, in the last chapter of the book.

ent so-called sciences or systems of knowledge, the science of psychology does not inquire. But psychology must, at least, note this implication as a fact underlying the rise and development of all conscious processes of ratiocination. (4) It is also implied that a difference exists between correct reasoning and incorrect and invalid reasoning; and that this difference depends upon the success or failure of the relating faculties to correspond to the actual relations of existing objects. Here again we uncover metaphysical questions that concern the origin and nature of that *conviction* which belongs to the use of the intellect in the elaboration of experience.

§ 4. It is scarcely necessary to point out in detail the dependence of logical conclusion upon the development of all the other so-called faculties of mind. As reasoning enters into all highly analytic and conceptual perception, so it, in turn, depends for its development upon such acts of perception having been already performed. Every complex object of perception is capable of being *thoughtfully* regarded from any one of innumerable points of view. Thus the mastery of any object requires us continually to be devising middle terms, through which we may reason our way into relating it to other items of our experience. For example, on first seeing a jaguar, we conclude from its general appearance (stripes on the back and sides with whitish belly, etc.) that it is "some sort of a tiger;" or, being more expert in zoology, from its serrate teeth that it is "carnivorous," etc. But this very object of perception subsequently becomes a suggester and source of middle terms through which to bring into relation with past experience other new objects of perception. Plainly, moreover, this process of drawing conclusions through middle terms requires advanced development of the image-making faculty, in the form both of memory and of imagination. He who has no stores of recognitive memory has no source of middle terms through which to reach conclusions; to conclude that the jaguar is a carnivorous animal one must remember that "serrate teeth" are the mark of such an animal. And the history of the mental processes of every boy who toils over the solution of a mathematical problem, illustrates what the entire history of mathematics shows—namely, the place of imagination in demonstrative reasoning. Not only must imagination work constructively, to hold the problem clearly before the mind, and so to set forth the end or goal of the process of ratiocination; it must also work inventively, to devise the various connections of lines, etc., which may serve as middle terms in the train of reasoning. "The geometer's sagacity," says Professor James, "lies in the invention of the new lines." Nor is a high degree of developed volition unnecessary to the drawing of conclusions. For although, in inductive reasoning especially, the hypothesis or theory which includes the explanation of the individual experiences may seem to thrust itself involuntarily before the mind, *will* is indispensable, with its trained exercise, to hold attention upon the goal, to make selections among the media that memory and imagination suggest, and to direct along chosen lines the entire so-called "train of thought."

§ 5. The truth that the conclusion of a process of reasoning presents

itself as a problem for solution, or as a doubt to be set at rest, is closely connected with the *teleological* character of all reasoning. In general, we reason "in order" to discover whether, or not, some relation which is not immediately obvious may be established, defended, and confirmed, or rejected. This general purpose divides itself into as many particular purposes as there are problems to be solved, or doubts to be set at rest. And these depend, for every man, upon his past experience and upon his hopes, fears, and practical interests. For each individual his particular end, or goal, in reasoning will be to know, or to defend, or to reject, some particular proposition which seems to him important or interesting. Thus we are all constantly asking ourselves, with respect to things which do not work as we wish them to, or which do not turn out as we expect them to: What is the matter? Why not? and, Why this way rather than that? All such questions, however, call for reasons, for processes of conclusion based on grounds and reached through middle terms. If one's shoes will not draw on as usual, one inquires and concludes as to the reason; just as Leverrier concluded from the disturbed movements of Uranus to the then unknown planet Neptune as their cause. *It is then the solution of the problem whether such a particular predicate shall, or shall not, be adopted in our concluding judgment, which is sought in all acts of reasoning.* In *this end to be reached* lies the supreme purpose of the logical processes. "Psychologically, as a rule," says Professor James,[1] "*P* overshadows the process from the start. We are seeking *P*, or something like *P*." . . . And "if *P* have any value or importance for us, *M* was a very good character for our sagacity to pounce upon and abstract. If, on the contrary, *P* were of no importance, some other character than *M* would have been a better essence for us to conceive of *S* by."

The different Kinds of Reasoning which logic recognizes all receive their psychological explanation under the principles which have been enunciated. The essence of all logical conclusion being the connection of one judgment with other judgment as its reason or ground, the different orders of relation under which this synthesis takes place furnish the different principal kinds of reasoning. These orders of relation have already been noticed in treating of the characteristics of conceptions and the resulting kinds of judgment. If the propositions employed in the reasoning concern relations of *resemblance*, or *difference*, then the act of inference moves along the line, so to speak, of like or unlike characteristics. The general principle may then be said to be: objects which are known to have one or more characteristics in common with a third class of objects, may *with reason* be concluded to have, in common with each other, a sufficient number of characteristics to be classed together. *If S and P are both like M, then they are like each other, and deserve the same name.* But of two objects, one of which is known to have character-

[1] The Principles of Psychology, II., p. 333.

istics in common with, and the other to have characteristics different from, some third other, there is reason to affirm that they should not be classed together; and such objects should have different names.

Further, inasmuch as all objects of sense-perception necessarily exist in relations of *space* and *time*, and since all events in the stream of consciousness and in the world of external changes stand in relations of time, propositions affirming or denying particular spatial or temporal relations, may afford grounds for conclusions. The principle here is that of "the apprehension of connections in space and time." Objects considered as idealized, may be made the subjects of reasoning under the general relation of space. Thus, the different geometrical forms—triangle, square, etc.—may be considered as related by resemblance and difference into classes (right-angled triangle, obtuse-angled triangle, etc.). What is concluded, *with good reason*, to be true of one triangle is attributed to all similar figures. But so far as objects of sense-perception and of self-consciousness are considered as coming under pure relations of space and time, they admit of another kind of inference. Hence that peculiar form of demonstrative reasoning which is possible in mathematics alone. The character of such reasoning is due to the relations in which the objects reasoned about stand both to the imagination and to the intellect. The elementary objects of mathematical reasoning are constructions of the imagination on a basis of the abstracting and comparing activity of thought. They can, therefore, as pure, abstract ideas, be inspected and intuited, so as to make the whole nature of their forms and relations clearly evident; and middle terms can be devised, such that the steps of inference shall admit of relatively small chance for any omission or mistake. In such "chains" of ratiocination, each particular judgment affirms some relation of quantity between different extensions of space or different numbers; *S and P are thus discovered to be quantitatively related in a particular way through M, which is some third magnitude comparable to both.*

It is under the form of judgment which attributes *action* to an *agent* (see p. 448 f.) that inferences in the line of cause and effect originate and develop. In essentially the same form do we find the intellect of man concluding with respect to interacting forces and laws. For the conception of force is inseparable psychologically—at least in its origin—from the consciousness of conative activity. The conception of law, too, is primarily that of the mode of the behavior of some agent. Under these two relations ("force" and "law"), which are so subtly intermingled

both in reality and in mental apprehension, a wide field of conclusions, otherwise closed even to the mind's entrance, is mastered. For who does not see that those words so glibly used by physical science, have reference to presuppositions that quite outstrip the data hitherto discovered in our description and explanation of the phenomena of consciousness. Postponing further treatment of these abstract conceptions, we now notice them only as conditioning certain kinds of inference. Whenever one sees certain signs of force (movements, changes), one immediately concludes the existence of an agent with the force necessary to produce them; when one believes in, or knows, the presence of an agent with the necessary force, then one concludes that signs of the agent's force have manifested, or will manifest, themselves. In this way *every perceived change* (or effect) *P is inferred to be due to the action of some agent S; for the reason that M, which is the known common sign of S, is connected with P; therefore P*—the cause of which affords the problem to the mind—*is a case to be attributed to S.*

§ 6. The distinction of logic between an *enthymeme*, or single sentence connecting the concluding judgment with its ground by the words "therefore," or "because" (for example, "the President is fallible, because he is a man") and a complete *syllogism*, is not important for the psychology of reasoning. The enthymeme has been defined,[1] as "an argument in the form in which it would naturally occur in thought or speech." This is true, because this form puts the predicate into connection with the subject as a problem which has been solved by the discovery of a reason; thus, *S* is *P because* it is *M*. Nor are the distinctions of the three *figures* of the syllogism psychologically important. For the procedure of the intellect is substantially the same whether we say:

I.		II.		III.
M is *P*	or	*P* is *M*	or	*M* is *P*
S is *M*		*S* is *M*		*M* is *S*
∴ *S* is *P*		∴ *S* is *P*		∴ *S* is *P*.

In each of these cases, it is alike implied that there is something in the syntheses of the two judgments already incorporated into experience (a synthesis established between *M* and *P*, and another established between *S* and *M*), which affords "a ground" for a new synthesis; and this something is the relation they both sustain to a third common something (to the middle term *M*). Nor is the nature of the binding intellectual act changed when the compound synthesis is thrown into the terms of an hypothesis; thus—if *M* is *P* and *S* is *M*, then *S* is *P*.

Various statements have been adopted by logicians to set forth the so-called "law of the syllogism," the nature of the bond which makes the con-

[1] Thomson: Outline of the Laws of Thought, p. 240.

clusion valid. According to Aristotle this law is the *dictum de omni et nullo;* "Whatever is affirmed or denied of a class distributively, may be affirmed or denied of any part of that class." But according to Kant, who wishes to emphasize the intension of the conceptions in the judgment, the law is rather to be stated: *Nota notæ est nota rei ipsius;* while Leibnitz, apparently emphasizing the extension of the judgments, would state the law thus: *Contentum contenti est contentum continentis.* Of these three forms of statement, that of Kant is by far the most suggestive. For at least, that kind of reasoning which moves along the line of resemblances and differences may be said to fall under the principle: the "mark of a mark is the mark of the thing itself." For example, suppose the question to arise, whether the jaguar is a carnivorous or a graminivorous animal; or whether the lady's-slipper is an orchid, or not. Now, the mark of the jaguar is to have serrate teeth, and the mark of the carnivorous animals is to have the same kind of teeth. Again, to have its stamens and pistils united in a single column, with the petals ranged irregularly around, is one mark of the lady's-slipper; and to have small, round tubers is another mark; but both these are marks of the orchid family, therefore the lady's-slipper should be classed as an orchid. In similar way, it should be noticed, is scientific recognition customarily established; and this, sometimes through a series of middle terms, or marks of marks, many of which are exceedingly difficult of observation. Scientific differentiation also consists in a yet more difficult and precious work of reasoning along such lines. Shall nerve-commotion, for example, be classed with that form of motion to which we ascribe the name electricity? Thousands of experiments and scores of carefully conducted chains of ratiocination have attempted to answer this inquiry; and even thus we have only partially succeeded in making the requisite distinctions.

§ 7. The peculiarity of *mathematical reasoning* depends upon the nature of those processes by which conceptions of abstract spatial qualities and relations, together with conceptions of number and of relations of number, are formed. These processes, like all those which result in the formation of so-called "conceptions," are the achievement of imagination and intellect, working in conjunction.[1] For example, the formation of the conception of a "straight line" begins by some such exhortation to imagination as the following: Select any two points (*a* and *b*), and let some point move between the two in such way that, starting from one of the two as its point of departure, the moving point shall go, *without deviation*, toward the other as its goal. Or, as Kant was fond of saying: If you would know what a straight line is (its "conception"), you must draw it, or construct it by imagination. Meanwhile, the exhortation to intellect is: attend only to the *direction* of the movement, as defined by the points *a* and *b*, and form an abstract idea of this limitation of "direction," irrespective of what is moving and of the particular point of departure or of cessation of movement. In similar manner, by a more complex act of synthesis, in which both imagination and intellect take part, the conception of a triangle may be formed. But the formation of this conception requires counting up to the number of three, and the synthesis of so many straight lines, having similar relations to each other ("forming angles," that is to say), into a unity. Now, it is by

[1] Comp. Porter: The Human Intellect, p. 456 f.

straight lines drawn in all directions, and by triangles of all possible sizes and shapes—both employed as "middle terms"—that the conclusions of mathematical reasoning, in the geometrical branch of it, are chiefly reached. For all amounts of direction-extension are measurable and comparable only *by means of* lines; and all superficial extension is measurable by means of the simplest form of enclosed superficies, which is the triangle. In the arithmetical branch of mathematical reasoning, however, the primary conceptions are those of number; and these conceptions are formed by "counting." The act of counting involves both imagination and intellect proper in a developed form; since this act is really a series of acts, or a process, which results in a judgment terminating the series by forming some conception of number to which a particular name (as "five" or "seven") is given. All mathematical processes of this order are therefore reducible to the two forms of "counting on" and "counting off;" and mathematical reasoning in this form is a series of judgments of relative magnitude, *mediated* by a number of middle terms. [Thus, the answer to an arithmetical problem is: So many *lbs.*, or $, or *per cent.*; *if* certain given conditions are to be fulfilled. And in algebra; x = so much, and y = so much, more or less than x, etc.]

In the early stages of mathematical reasoning the perception of concrete objects is indispensable to the formation of conceptions, and to the drawing of conclusions. The child learns to know what a straight line is, only by seeing a line that does not *markedly* deviate from a direct course between the two points which terminate it, and then comparing such a line with one that plainly does *not* follow a direct course, but *is* curved or bent. Yet even thus the imagination of the child, according to the *dictum* of Kant, must construct the line—as a resultant of comparison upon a basis of repeated acts of perception—in order to recognize its straightness, as such. So, too, are grains of corn, marbles, or the balls of an *abacus*, useful perceptions in encouraging and developing the primary conceptions of number and of numerical relations. It accords with known psychological laws that, just in proportion as such aids are habitually employed, mathematical conclusion loses its true intellectual or logical character, and becomes a matter of perception and ideation according to the laws of association. For example, the tradesman of Japan will calculate prices, by means of his *soroban*, with almost incredible rapidity and with a high degree of accuracy; but he knows little or nothing of *mental* arithmetic. Very simple acts of genuine mathematical reasoning are quite beyond him: he is a perceptive, ideating, calculating machine, and not a reasoner respecting relations in space and time.

§ 8. An elaborate employment of reasoning faculty is undoubtedly necessary in order to form the conception of "causation;" and a yet higher development is marked by the attainment of clearly defined notions respecting the meaning of such terms as "agent," "self-activity," "doing," and the like. But, on the other hand, one principal form of logical conclusion is itself developed along the line of this conception. This is simply a case of the intellect following the laws of its own evolution without any corresponding development of the consciousness of the existence and significance of those same laws. For in every form of mental life, we *do*, without knowing *what* we do. Very early in his mental growth the child begins to explain to

himself the more noteworthy events in his experience by attributing them to the doings of things or persons, not hitherto associated with precisely these same events. *Such intellectual activity constitutes a beginning of ratiocination along the line of causal influence.* It is at first and usually, connected with events which are interesting and strange; for such events both excite and demand an explanation. In other words, every such event may be said to offer a new problem to the intellect for its solution. This problem is not, however, statable in the terms: "What is it?" but is rather to be expressed in the question: "What person or thing did this?" It is essentially the same general problem with which all human science chiefly occupies itself —namely, "What are the causes of this event (the forces operative, and the laws under which they operate)?"

It is chiefly by this kind of ratiocination that we transcend the limits of the present and bring its experiences into permanent and rational connections with what is remote in space and time. Thus the present becomes related to the past, not *merely* by way of recognitive memory under the laws of association, but as finding in that past the reason, or ground, why the present is as it is rather than otherwise; *what is present in time is explained by what was past in time.* Similarly, too, is the event present in space explained by some agent, invisible on account of its remoteness, or on account of its being by nature not adapted to appreciation by the senses. For it is the same intellect behaving in essentially the same way, which puts spiritual "powers" in the air, sprites and fairies in the green wood, introduces ghosts or other "telepathic" influences to account for changes whose causes are not sensuously manifest, and which theorizes as to "luminiferous ether," "atomic entities" with a variety of "natures," etc. All such beings are alike "concluded to;" because neither perception nor memory alone enables us to explain the present happenings by agents whose connection with these happenings is matter of presentative experience.

Very early, also, does the expectation of the child take on an intellectual character. It ceases to be *merely* an attitude of mind which results from unreasoned past association: it becomes more or less of an expectation that attempts to base itself upon grounds and to depend upon justifiable conclusions—*an expectation that knows why it exists in this particular form rather than in some other.* Doubtless the early conclusions of human mental life are not genuine logical conclusions: they are "conclusions" only falsely so-called. The child that refuses his milk or his bath when he sees vapor arising from the cup or the tub, is by no means necessarily drawing a logical conclusion. He may simply be the subject of inhibition from a suggested idea. What stimulates and guides the development of rational expectation with reference to the future is chiefly the occurrence of interesting and important exceptions. As said Leibnitz: "Reason alone is capable of establishing sure rules, and of supplying what is lacking to those which are not sure, by inserting their exceptions." He has a wise and developed intellect who can say: "Generally, but not always" (comp. p. 458 f.).

The movement of mind in this kind of reasoning may be illustrated by the following example. A child of the author's acquaintance, having seen his toy-balloon sail away skyward, after a malicious boy had secretly severed the string, was asked what had become of it: he replied that "God had

carried it off." Here was undoubtedly a case of genuine logical reasoning. The event was strange, and the interest awakened by it great. If the balloon had fallen to the ground, after the customary fashion of things, no conclusion would probably have been suggested to the boy's mind. But so interesting an exception to ordinary experience constituted a special problem in causation; and the agent suggested to serve as cause was, of course, that one whose powers and doings had previously been connected with events skyward.

§ 9. No psychological interest attaches itself to the attempt to throw the foregoing kind of reasoning into the form of a syllogism of the "First" (or of any other) "Figure." We should only indulge in profitless quibbling by saying: Major premise,—All cases of mysterious events, having to do with the sky are cases of divine action; Minor premise,—This is a case, etc.; Conclusion,—Therefore, etc. For such a syllogism would not represent the actual movement of the child's mind. Better adapted for this purpose would perhaps be some such syllogism as the following: All events that challenge explanation, as exceptions to ordinary experience, require some special agent to account for them; this is such an event; and therefore, etc. The mental representation of *the* special agent in this particular event may then be left wholly to association. Such a fictitious major premise is itself, however, nothing more than a statement of that law of the intellect which has been recognized as at the roots of all reasoning, and as the origin of our conception of causation itself.

§ 10. While all three kinds of reasoning fall under one essential principle of all reasoning, and while they are all necessarily combined in the development of knowledge, they stand in somewhat different relations to the several branches of the growth of knowledge. (1) It is pre-eminently by conclusions through mediated comparison of the marks of objects (Kant's dictum, *Nota notæ est nota rei ipsius*, or Aristotle's *dictum de omni et nullo*—according as intension or extension of the conceptions is regarded) that our knowledge of the essential qualities, or traits, of things is attained, and that classification and definition are advanced. But all conceptions are growths, not only for the individual but also for the race; and consequently all definition and classification are subject to change as knowledge grows. Indeed, different groupings of so-called "marks" may, with equal propriety, be adopted, according as the point of view changes and the end to be reached varies on the part of the conceiving mind. Nor can either the individual or the whole body of expert inquirers ever be sure that all the essentials in any conception have been comprehended in the definition. In this respect the logical distinction between simple and complex conceptions is only relative. It is, however, by conclusions drawn under the principle of "a mediated likeness or unlikeness of marks," that conceptions and the dependent work of definition and classification grow.

(2) In all forms of applied physical science, as well as in pure mathematics, calculation by means of arithmetical and geometrical conceptions takes a most important part. Even psychology has, especially recently, been much urged to employ this form of reasoning. In a guarded way, and especially in the region of so-called "psycho-physics," this science has already made profitable use of the mathematical method. A largely, or purely,

mathematical psychology, or logic, has been attempted; but the result of this attempt seems to us as worse than a doubtful success. Nor can we think that the biological and social sciences will ever derive their conclusions chiefly in this kind of reasoning. On the other hand, mathematical reasoning legitimately enters into our processes of argument about all things and all events that are measurable; and *measurable*, to some extent, are all things and all events that belong to time and space.

(3) The knowledge that grows by the third kind of inference is, as has already been implied, the knowledge of causes, of real forces, and of laws. Here, since forces are measurable and comparable in terms of time and space, and since the formulas which state the uniform modes of their action are called laws, mathematical reasoning is also necessarily employed.

Processes of logical reasoning are also distinguished as Inductive and Deductive. The puzzles suggested by writers on logic concerning the nature of both of these kinds of reasoning have been neither few nor slight. In fact, however, no actual process of inference consists of one of these "kinds" to the exclusion of the other. On the contrary, *induction and deduction are, psychologically considered, in principle essentially the same; both alike consist in reaching one judgment as a conclusion, on the basis of other judgment as its reason or ground.* It is ordinarily said (and with a certain degree of truth), however, that in "induction" a general principle is concluded from particular instances; but in "deduction" a particular case is concluded under a general principle. Or to say the same thing in another way—in induction we reason that because it is so in one or more cases of our experience, therefore it is so in all similar cases of experience (has been so, and will be so—generally or universally). But in deduction we have already attained the knowledge of the general or universal principle applicable to similar cases; the problem of this particular case comes before us; and we solve it by remembering, assuming, or showing that *it* comes under the already known principle. In induction, then, we conclude that A is B, because we have observed that a and a^1 and a^2 (all essentially alike and capable of being grouped under A) are B. In deduction we know, or assume as known, that A is B, and conclude that a^3 (which we have never met with before) is B.

"Inference on Grounds" is, therefore, characteristic of both induction and deduction. As a suggestive writer[1] on this subject —although from the logical rather than the psychological point of view—has declared: "The distinction . . . erroneously described as the distinction between Induction and Deduction is chiefly a distinction of *aspects*, largely based on a confused

[1] Bosanquet: Logic, II., p. 118.

idea of Induction, but yet in some degree justified." Further on, the same writer: "We may take Induction as Inference viewed from the side of the differences, Deduction as Inference viewed from the side of the universal." The correct distinction is, however, better brought out from the psychological point of view by saying that, in induction, we start from observed likenesses and unlikenesses in individual cases (analysis being primarily involved) and solve our problem by concluding that the reason is to be found in some general or universal relation among the individuals. But in deduction we start rather with an assumed solution of the problem offered in the individual case, and prove by inference the correctness or falsity of our assumption by relating the case to some generalization regarded as already established. The need of hypothesis in both so-called kinds of reasoning, as well as their common use of inference in all its essential psychological traits, confirms the truth of their essential similarity. In both induction and deduction alike, the intellect displays the law of its own life and movement—namely, the tendency to leap from observation of the particular, and from the problem which observation proposes, to the apprehension of the universal; then to inhibit itself by regarding the differences which other observation reveals; and then, finally, to organize and to validate experience by concluding all its items under some improved form of the universal.

§ 11. Much subtile discussion has been indulged in by treatises on logic over the question, How can knowledge grow by inference at all? This question may be asked with reference to induction so called, as well as with reference to deduction in syllogistic form; although in the latter case it is more easily comprehensible and more impressive. For example, it may be said: Unless I know absolutely that *all M* is *P*, how can I infer with confidence that, because *S*, in particular, is *M*, therefore *S* is *P*? Again, how am I thus absolutely to know that *all M is P*, unless I have observed, or learned from those who have observed, that each particular case of *M* (m and m^1, etc., up to m^n) is *P*. But if I already know *P* to be true of every case of *M*, then I know it of *S*, and do not need to "prove" it; indeed, How could I *prove* it if my major premise were not first established? How, then, —it is asked, in general—can deduction increase knowledge? Or, turning to the argument by induction, it may be said that reasoning can never prove the universal proposition: *All M is P*. For one can never be sure that one has observed all cases which properly fall under *M* (all the possible series, m, m^1, m^2, *etc.*). Therefore all one is entitled to say is: Every m which I have observed *has been P*. But how can this serve, of itself, as "proof" of my conclusion that *all M is* (has been, and will be) *P*? Must it not be admitted, then, either that sure proof is impossible, or else that it is of no use?

The answer to such logical puzzles as the foregoing is, from the point of view of psychology, not difficult to find. Briefly stated, we are led by such puzzles simply to admit: None of our inferential knowledge—our judgments concluded on other judgment as ground—is absolutely certain. "Guessing," or hypothesis, enters into all such knowledge. It is true we can never conclude *with absolute certainty* that *all M* is *P*; or that every other particular case of *M* which we shall meet will also be *P*. *In every act of induction, if such act is genuine induction and not mere enumeration and summation of memory-images, as it were, a hypothesis is introduced.* And, in fact, science, and even ordinary experience, is constantly engaged in finding out that *all M is not P;* for science and experience grow quite as much by correcting mistakes and by making exceptions to rules as by so-called "establishing" of general or universal principles. Indeed, we saw (p. 466 f.) that all reasoning itself implies the change and growth of our conceptions. *So also in every act of deduction*—no matter how firmly established the major premise may seem to be—*there is a concealed hypothesis.* Exceptions *may* occur; every new case, however obviously it seems at first to come under the general principle, *may* prove an exception; we *may* find in this particular case of apparent "*S* is *M*" a reason for the modification of the premise "*All M* is *P*."

The remarks just made might be illustrated by the entire history of the development of knowledge in the individual and in the race. Properly speaking, *all conclusions are only more or less highly probable hypotheses, according as they stand related to the entire organism of experience, under the laws of intellectual life.* For example, no principle of physics is better established than that of gravitation, so called; popularly expressed, with reference to the earth, all bodies heavier than the atmosphere, if left unsupported, fall toward the earth's center. But here, on the one hand, we have certain alleged cases of "levitation," and, on the other hand, the inquiry of astronomy as to whether all the stars do actually come under this principle. Again, few propositions could be confirmed by a greater array of evidence, or are of greater practical as well as scientific import than this: "The mental states of man are communicable only by means of bodily changes in one individual which act as signs that effect the well-known forms of sense-consciousness in other individuals." But here again we have alleged facts and elaborate theories of "telepathy" and "rapport" struggling for scientific recognition and boldly inviting scientific inquiry; we have also certain curious phenomena of common psychical impulses, or vague forms of ideation, simultaneously affecting large numbers of people. Such merely possible exceptions may not furnish sufficient evidence for the reconstruction of accepted principles; they may not properly induce every candid man to consider the possibility of such reconstruction. Yet he who remembers how the sagacious Kant considered it an "*a priori* principle" that no material body can influence another without contact, or who is familiar with the difficulty which all the most cherished universal propositions in science have had in establishing themselves, will recognize the truth of our contention.

§ 12. No rules applicable in all cases can be given for the justification logically (*i.e.*, in view of the principle of *sufficient* reason) of the act of induction. A single significant experience may justify the universal proposition: "All *M* is *P*," or "No *M* is *P*"—in the form of an hypothesis, to be more or

less confidently accepted, while waiting for other cases of *M*. The tendency of intellect in this regard is similar to the tendency of image-making faculty under the principle of association. The child who has been burned by its steaming cup of milk, or stung by an insect, or bitten by a snapping dog, not only experiences the inhibiting image of associated pain, on encountering again a similar object; but—if any genuine work of inference is done—it also concludes that all similar objects ought, for good and sufficient reasons, to be avoided. And not a few important scientific discoveries have been made on a basis of no more significant inductive inference. It is, indeed by emphasizing as clews those likenesses and unlikenesses which have been just observed for the first time, or which to the ordinary observer seem to need no explanation, that superior sagacity manifests itself.

§ 13. But guesses, or hypotheses, require confirmation, or they cannot safely be accepted as grounds for other conclusions. The various so-called "experimental tests" which science emphasizes are simply refinements—made possible largely by special equipment of instruments—of the methods employed by every intellect to render its reasons, or grounds for being influenced, *sufficient*. The word "sufficient" must here be understood as suggesting the satisfaction which the mind feels in becoming aware of the relations that bind its experience into the higher forms of unity. These tests are summarized in the so-called rules or "methods of induction." Of such the following three are ordinarily recognized: (1) The method of agreement; (2) the method of difference; (3) the method of concomitant variation. It has already been shown that the combined use of both the first two methods is made in all complicated inference. Objects or events that are observed, or otherwise known, to have like qualities or conditions, are inferred to belong to the same classes, or to be due to the presence of the same agencies, or causes. But, in so far as objects or events differ in important ways, they must, as effects, be assigned to different classes and agencies, or causes; and, as causes, they must give rise to different effects. Or, if we can measure the concomitant variations in different objects and events, and if we discover that their variations have proportional intensities, then again we may infer a connection in respect of classes or causes. Thus, the gardener concludes: "Because my apple-tree declines in vigor as the 'scale' spreads over its bark, therefore the spreading of this pest is the cause of the tree's declining in vigor."

§ 14. The foregoing discussion throws light on the relations which the process of reasoning brings about between the particular and the universal. In their interest in the purity of logical formulas the older logicians emphasized the necessary connection of particular cases with general principles as giving cogency to the syllogism. Thus I infer and surely know that the man *A B* will die (is mortal) *because* "all men are mortal." This "Figure" of the syllogism—to which many writers on logic would reduce all the other Figures—represents a sort of universal law as ruling over and compelling the particular to fall under it and obey it. But mere law is impotent, mere form can do nothing. Neither the real cause for particular occurrences, nor the reason for the content of the conception answering to an individual object, can be found in the universal. On the contrary, the real reason for every law is the behavior and the nature of individual beings. They dictate

the law; and it does not compel them—except as we choose to use an interesting but misleading figure of speech. John Stuart Mill,[1] in opposition to the older logicians, emphasized the movement of thought from particulars to particulars, in all forms of natural deductive inference. Of the proposition that "the Duke of Wellington" is mortal this author truly says—"it is evidently an inference; it is got at as a conclusion from something else; but do we in reality conclude it from the proposition, All men are mortal? I answer, no." Further on he adds: "When, therefore, we conclude from the death of John and Thomas, and every other person we ever heard of in whose case the experiment had been fairly tried, that the Duke of Wellington is mortal like the rest; we may, indeed, pass through the generalization, All men are mortal, as an intermediate stage; but it is not in the latter half of the process, the descent from all men to the Duke of Wellington, that the *inference* resides. The inference is finished when we have asserted that all men are mortal. What remains to be performed afterward is merely deciphering our own notes."

Neither of the foregoing views implies the true and complete statement of the psychological nature of inference. For if the "inference *is* finished" by reaching the proposition that all men are mortal, then we have already generalized; we have already somehow passed from the particular to the general. When, then, the question arises, whether the Duke of Wellington too, has died or will die (instead of proving immortal), our confidence that, in this case, too, death is the fate of the particular man, rests upon the ground that he *is* a man; and so cannot be exempted from that which belongs to all men. Actually, then, the intellect does leap from the particular to the universal, and so, hypothetically at first, extend its knowledge; actually, also, it does conclude from its acquired knowledge of the universal, as to what will prove true of the particular. Induction and deduction plainly combine in this compound process of inference. As Bosanquet[2] has said: "The verification of hypothesis has been considered, from Bacon downward, as an integral part of scientific induction. And nothing can be more deductive than the connection of an hypothesis with the consequences by which it is verified." Such a description answers not to scientific procedure alone; it is rather *the universal form of the movement of intellect in all its work of organising, by processes of ratiocination, the individual experiences which constitute the stream of consciousness.*

Two Universal Principles are customarily affirmed by logic to preside over the entire life of the intellect. These are called the Principle of Identity and the Principle of Sufficient Reason. As a complement, or the other side, of the former principle is the Principle of Contradiction. In its bare form, and abstractly stated, the principle of identity is made to affirm: "A is A." In its complementary form, then, the principle may be stated: "A is not both A and not-A," or, if by B we mean *not-A*, then: No A is B. These so-called principles cannot be conceived of as re-

[1] System of Logic (seventh ed.), Book II., Chap. i., § 3.
[2] Logic, II., p. 119.

sulting from observation or argument; they are rather taken for granted in all argument. The Law of Contradiction has been said to "supply something without which the Law of Identity is not logically complete nor *distinctly* intelligible." Both taken together, however, furnish no real or concrete truth. For there is no reality known, or that may be conceived of, which can be substituted for *A*, with the understanding that such reality *is* absolutely unchanging, or that its conception is not subject to the principle of growth. What, then, is meant by such a so-called "principle" of thought?

The principle of identity has no meaning except as understood in its application to judgment; and through judgment to that connection of judgments which we call reasoning. Thus understood, it simply binds to *consistency* all the way through the very synthesis in which judgment and reasoning consist. In the same judgment (and all truth is conceivable and affirmable only in the form of judgment) the conception answering to the subject (that which "we mean" by *S*) and the conception answering to the predicate (that which "we mean" by *P*), as well as the relation affirmed by the synthesis itself (that which "we mean" by the copula), must remain unchanged. S *is* S; P *is* P; the relation expressed by the copula *is* that self-same relation; neither must be changed without changing all. More abstractly still, when you judge, you judge; you cannot posit and negate, affirm and deny, at one and the same time. And this comes pretty near to saying simply that the intellect has judgment for its function, and that judgment is what it is—namely, the establishing of a relation, by an act of synthesis, between *S and P*.

§ 15. The absurdity of trying to *prove* the principle of identity is obvious enough. We may indeed amuse ourselves in somewhat the following way: Let us suppose that we try to argue, either for or against the principle as stated in its abstract form. Thus: The principle of identity must be true; for the *A* which stands in the place of the subject is, by hypothesis, *A*, and the *A* which stands in the place of the predicate is also *A*; and, further, the judgment itself is but a statement of the hypothesis that the *A* of the subject *is* the same as the *A* of the predicate. Or, again, if the principle of identity be not true, then we cannot be sure that the *A* of the subject is indeed *A*, which is absurd; the same thing is true of the predicate, and so on. But who does not see that by all this juggling with mere abstractions we assume, at every step, the very principle itself?

On the contrary, the changing character of all conceptions, and therefore of the truer and more comprehensive meanings of words, forbids us to substitute any definite and fixed conceptions for either the *A* of the subject or the *A* of the predicate, in the formula announcing the principle of identity. We may not affirm, for example, that the conception, or the reality, which

answers to the term "man," or "atom," or to any other terms, is to remain forever self-same. The generic man *may* develop so as not to be mortal; the atom *may* be itself shown to be a subject of evolution; at least, it is the forces and laws of reality and not the abstract logical principle of identity, which provides that no *such* change shall at any moment take place.

The law of Excluded Middle, which Aristotle expressed by saying, "Between the assertions of a logical contradiction there is no middle," is a sort of dependent abstraction based upon the acceptance of the two foregoing principles. "*A* is either *B* or not-*B*," is the bare logical formula for expressing the law. This so-called law applies to all strict denial; and all *strict* denial would be not only practically impossible but logically inconceivable, were not the principle of identity and its complementary principle assumed to be true and necessary. But what particular statements may be strictly denied, and on what principles we may separate the objects of experience into mutually exclusive classes, or assign changes to mutually exclusive causes, only experience can say; and the evolution of experience itself constantly gives the lie to many of our strictest denials.

The principle of Sufficient Reason is—as we have already seen—the one principle which is distinctive of, and which gives binding force to, all kinds of inference. It cannot, therefore, itself be proved by inference; the rather is it itself abstracted from that very form of the life of intellect which we call "inference." That is to say, the ultimate fact revealed by our scientific examination of those phenomena of consciousness, called processes of reasoning, when regarded in their order and connection, is this,—that *so*, and no otherwise, do they always occur. It is impossible, however, to frame a formula for this principle like that which logic employs for the principles of identity, contradiction, and excluded middle. Nor does the principle of sufficient reason itself give us the least information respecting what, in particular, is the "sufficient reason" of what—or as to the connections that may be established by a "because," or a "therefore," between any particular *S* and any particular *P*. Moreover, if we emphasize the word "*sufficient*," and then inquire as to what in our actual mental life corresponds to this word, we find that no definite answer can be given, either before experience or upon the grounds of realized experience. *Sufficient*—for what? Now the amount and kind of reason which *is* sufficient always depends upon a variety of considerations; such as the character of the objects or events we are reasoning about, the end (either practical or theoretical) which the reasoning has in view, the opportunities for investigation which the accumulated stores of the experience of the individual and the race afford, and even the subjective interests and habits of the reasoner, etc. In the

stricter sense of the word, sufficient reason belongs only to demonstrative reasoning in mathematics.

As to what is meant by "reason"—whether sufficient or insufficient—we shall further inquire in discussing the origin and development of the conception of causation. Three things, however, may properly be noted by a psychological treatise, at the present point: (1) By the principle of sufficient reason is obviously meant *the natural tendency of man, as a developing intellect, satisfactorily to explain his experience.* This is really, then, not an abstract principle at all, as is the principle of identity; it is rather, primarily considered, an exhortation arising from the depths of our intellectual life. (2) All the explanation, which intellect demands and pursues in the interests of its own self-satisfaction, involves the relating of one object to another, of one event to another, etc. *Everything is explained by being brought into connection with something else.* We understand *S*, only when we bring it into connection, by an act of judgment, with *P*; and since such relating can be direct only to a very limited extent, we explain *S* in relation to P *through* M. Thus *S*, *M*, and *P*, all explain each other; they are all apprehended as belonging to one world of connected objects and events. For (3) the *belief* that such a world exists, and that we may know it as it exists, not only by becoming immediately aware of it in perception and self-consciousness, but also by processes of ratiocination, *lies*, like a sleeping postulate, *beneath all the activity of mind according to the so-called principle of sufficient reason.* It belongs, however, to philosophy to explicate and defend this postulate.

§ 16. The exposition of the principle of sufficient reason by logicians has often been almost as unwarrantable as the use made of the allied law of causation in debates over free will, miracles, etc., by students of natural science and by theologians. This so-called "law of causation" is only the objectification, as it were, of the principle of sufficient reason. Its meaning, in general, is to assert our confidence that things *are* really connected as we find ourselves having reason to *know*, or *believe*, that they are. The use of the adjective "sufficient," as attached to the noun "reason," is suggestive; but is psychologically of no importance. It could strictly apply only to those products of our actual thinking which fully meet the ideal demands of logic; but this all products of thinking that relate to actual things and events fail to do. The entire phrase, then, should be held to be significant of that perpetual development of the life of intellect which results in giving a higher unity to knowledge; a more complex and well-principled organization to experience; a more comprehensive grasp on the world of known objects and events, as a system of beings with so-called "natures," acting under law, and possessing "forces" and "powers;" a wider theo-

retical and yet logically defensible outlook over the invisible realms of distant times and spaces, and of entities that cannot be made the objects of perceptive experience. Thus our "reasons" become more nearly ideally "sufficient," according as the development of intellect itself, on the part of the individual and of the race, goes on.

§ 17. It is interesting to note again the intimate connection between the development of intellect and the development of feeling and will. Apprehension of the true being of things not infrequently comes more through our æsthetical, or sensitive and practical, natures than through our logical. To *know* things, *we* must, in some sort, *live* our way into them. In matters of the so-called practical life we find this illustrated in the action and influence of what is called "tact." In matters of æsthetical and even of scientific and philosophical import, we find it further enforced by manifestations of what is denominated "intuition" or "insight." Here the most well-reasoned answers as to what and why often seem to be more than matched by the intellectually obscure but more feeling-full and rapid apprehensions of truth. The affective side of human nature, of course, influences the logical processes very strongly at their origin, and indeed all the way through. This will appear more clearly on consideration of the effect of intellectual interest, of unrest and dissatisfaction with ignorance, of pure and strong desire for knowledge for its own sake. Thus, inference is not only spurred to a quick, decisive bound, but somehow—it would almost seem—guided so as to light upon the right spot. In conclusion, every inductive process, too, originates largely in a sort of blind groping about after all possible movements of thought which may furnish the satisfaction of desire. He who does not *want* to reason is little likely to reach any conclusion; on the other hand, our conclusions are generally—as everybody knows—more likely to be the ones which we as reasoners want. Such a feeling of want also reminds us of the mental movement necessary to satisfy it; and, as that movement follows, we have the germinal form of conclusion in the narrower sense (the deductive syllogism). Nor is it unwarrantable to affirm that the development of will, as a sort of outcome from desire, is indispensable to the higher forms of ratiocination. There is truth, then, in the declarations of Göthe's "Faust:" "All comes at last to feeling," and "What you don't feel you'll never catch;" although this truth should not lead us "to despise intelligence and science, the highest powers accorded unto man."

[Besides the works referred to at the close of the last chapter, the following may be consulted: Spencer: Principles of Psychology, II., p. 86 f. Mill: Logic, Books ii., iii. James: The Principles of Psychology, II., chap. xxii. Carpenter: Mental Physiology, i., chap. 6; ii., chap. 12 f.]

CHAPTER XXI.

SPACE, TIME, AND CAUSATION

THE peculiarity of the relation which certain of our conceptions sustain to our entire mental life is made obvious only by a process of reflective thinking. So subtile and intricate is the development of this life, and so late the awakening of critical interest in its fundamental laws, that it is not strange to find different students holding widely different opinions as to the origin and significance of such conceptions. While, of course, it is true of *these* conceptions, above all others, that their more precise content represents, in the case of different individuals, widely different degrees in the development of thinking faculty.

Conceptions of the kind to which reference has just been made have received a great variety of names at the hands of different writers in the history of psychology and philosophy.[1] Among these the term "categories" (or "predicaments" resulting from the processes of thinking and naming) is as old as Aristotle. The full treatment of the categories, as related to the processes and the results of knowledge in a large and ultimate way, belongs to the philosophical theory of knowledge; but regarded as forms of real being, the categories are of metaphysical import. It is enough for scientific psychology to note their existence, as it were, and to describe such of the mental processes resulting in these conceptions as are most directly involved in the history of mental development.

It has just been said that the conceptions which are called the "categories" have *peculiar* relations to our entire mental life. As respects their strictly psychological origin and character, however, there is little apparent reason to speak of them as "peculiar." In one passage of his writings Aristotle enumerates the following ten: Substance, quantity, quality, relation, place, time, situation, possession, action, and suffering; he appears to have regarded them as applying both to things and to words. But considered as an actual mental process there is no

[1] For a list of these terms see Hamilton: Lectures on Metaphysics, xxxviii.; and Reid's Works, note A, § v., p. 755 f.

one of these ten whose origin and development does not conform to the descriptions already given of the elaboration of experience through thought-faculty. Of the three categories whose names stand at the head of this chapter, for example, we may unhesitatingly declare that the actual mental processes answering to the names are performed in essentially the same way as are those through which we pass in forming all our other conceptions. When I think of space, or of time, or of causation, I have no peculiar experience (no so-called "intuition," or immediate rational awareness or insight into the nature of things) answering to these words. So far as descriptive psychology goes, these conceptions arise and develop in essentially the same manner as do all other conceptions.

Even from the predominatingly psychological point of view, however, there is something peculiar about the relation in which all the true categories stand to the development of mental life. This psychological peculiarity consists chiefly of the following three characteristics: (1) Regarded as thought-products these conceptions are capable of reaching a high degree of abstraction; and of being illustrated, as it were, by a correspondingly great variety of widely different acts of the image-making faculty. For example, as the result of a series of judgments based upon experiences with extended objects of perception one may reach the bare thought of the "possibility of extension in general;" and may give to this abstraction the name of "space." On the other hand, in "realizing" to one's self what one means by space, one may employ a variety of images of past or possible extensions and movements of objects; and may say to one's self, "That is what I understand by space." On comparing such a compound act of thinking and imaging as this with the act which is performed in connection with words denominating classes of objects—such as "man," "mammal," or even "soul" and "thing"—we cannot fail to note the differences between the two. (2) Connected with this peculiarity is the content-less character of the categories. These conceptions, in their most abstract form, have no variety of marks which the synthesis of judgment grasps together in giving import to the name. It has been said[1] "the act of apprehension produces no content of ideation which is not already contained in the content of the being that is ideated." For example, if I conceive of space as "pure mental form," or as the "possibility of indefinite extension in general," etc., my act of conception does not enable me to add anything to the actual content of my perception, or of my imagina-

[1] So Beneke: Pragmatische Psychologie, ii., p. 175.

tion, or of my conception of any particular thing that is actually extended. (3) The existence of these conceptions, when considered merely from the psychological point of view, compels us to admit: We are able not only to think about all manner of objects, and put the results of thinking into the perception, memory, and imagination of all manner of objects; but we are also able to think about the ultimate forms of thought itself. We can, by thinking, form conceptions of the processes of perception, memory, imagination, and conception—as secondary and higher products, as it were, of intellectual life. In some sort, then, the categories are realized as thinking that has for its objects the very processes of perceiving, remembering, imagining, and thinking, themselves.

To sum up these characteristics: *By "categories" psychologically considered* (that is, regarded as phenomena of consciousness), *we mean those highly abstract conceptions which the mind frames by reflection upon its own most general modes of behavior.* They are our own notions, resulting from co-operation of imagination and judgment, concerning the ultimate and unanalyzable forms of our own existence and development. In so far as our notions are correctly formed, and so are supposed to represent the ultimate facts of mental life, the categories may be said to *be* the ultimate forms of mental existence and development.

§ 1. The doctrine of the categories has been much debated, not only in treatises on philosophy and logic (where such debate more properly belongs) but also in writings on psychology. The term most popular in Great Britain and America for this class of conceptions has been, perhaps, the term "intuitions." But such a term is particularly inappropriate for this class of conceptions. To "intuit" is to see presentatively, face to face, as it were; and "*the* intuitions" should refer only to such classes of objects as admit of being envisaged, or known with that immediate awareness of cognition which presentative experiences, whether of sense or of self-consciousness, alone have. Now I can thus ("intuitively") know an extended thing by sight, or by touch; I may even regard myself as, in a peculiar manner, standing face to face with the memory-picture or with the object constructed by imagination—although psychological classification regards such objects as belonging to the representative rather than the presentative group. Pre-eminently true is it also that I, and no other, have a face-to-face knowledge of my own mental states as such—of my pleasures and pains, my desires and purposes, etc. But the knowledge signified by such abstract terms as space, time, causation, and the other categories, is the furthest possible removed from any similar *envisagement* or intuitive cognition by the mind. Indeed, it would be more correct to say that every one has many intuitions of *spaces, times,* and *causes;* and then by a process of generalization and reasoning reaches the ability to give some sort of meaning to the words "space," "time," and "causation." But the really correct thing is to say that, in the processes of

perception by the senses and of self-consciousness, I intuit, or envisage, extended things and events enduring in the world or as states of my own mind, and relations between things which I explain causally.

§ 2. Because the intellectual development on which they depend is capable of being carried to a greater or less extent, and to a far greater extent in the case of some individuals than others, the conceptions answering to the term the categories are very different in different cases. In no other conceptions are the effects more clearly seen of original or acquired skill, of the amount of attention given to the subject; and even of age, sex, habitual modes of the activity of the senses, imagination, etc. There is undoubted truth, from the psychological point of view, in the statement that space is not, and never can become, to one born blind, what it is to all who have normal vision. Says Lotze[1] in speaking of the sexes: "Analytic reflection upon their own movements is so little familiar to them that one may affirm, without fear of being very far wrong, that such expressions as, *to the right*, *to the left*, *across*, *reverse*, express, in the language of women, not any mathematical relations, but certain particular feelings which one has when in working one makes movements in these directions." What is true of the subordinate determinations of spatial properties and relations, is even more true of that mental determination which corresponds to the sum-total, as it were, of such properties and relations. Different individual conceptions of space are far more variable than the conceptions of such spatial relations as, "to the right," "to the left," etc. What is true of space is just as true of time and causation. The child's conception of time, or that of the savage, differs most markedly from the astronomer's or the philosopher's. But the astronomer and the philosopher do not, actually, conceive of time in the same way.

Whence, then, it may be asked, do these conceptions derive their *peculiar* character—that character which entitles them to be called categories? Psychologically considered, the peculiar character of the categories consists chiefly in the three points just mentioned, and by referring to such differences in the processes by which these conceptions are formed we may understand the meaning of the customary tests of a category, namely—(1) originality, (2) universality, (3) necessity. These processes, indeed, give token of no *new faculty* (*e.g.*, so-called reason as the "faculty of intuition"). These processes *are* rather the application of all the mental faculties to the very conditions of experience itself, with a view intelligently to conceive of such conditions. If, then, the inquiry be raised, why does not the dog—that most intelligent of the lower animals—give evidence of a knowledge of the categories; why does not it show tokens of having intuitions of space, time, and causation, as original, universal, and necessary cognitions? The answer is not to be found in the animal's lack of some one faculty, considered as a sort of storehouse of the categories. The answer rather is, that the dog is, apparently, quite incapable of performing a considerable number of those intellectual processes which are indispensable to self-understanding. It belongs to man only to learn to understand his own understanding. The dog cannot reflectively consider the meaning, or reason its way into conclusions as to the laws, of its own mental life. For this it has neither the necessary

[1] Microcosmus, II., p. 47.

imagination nor recognitive (self-conscious) memory, nor power of sustained thinking and drawing conclusions. Apparently, also, the lower animals have no intellectual interests or other forms of feeling, and no will to pursue trains of reflective analysis directed upon their own mental processes. Nor have we reason to suppose that they are metaphysical as man is; and so capable of developing a "reasoned belief" in reality as cognizable and representable by their own mental processes.

The categories are said to be "original," therefore, because they mark the last results of analytic and reflective thinking in preparation for the process of conception; no more lies beyond for thought in that particular direction from which we may derive and by which we may explain the nature of space, time, causation, and of the other categories. They are "universal," because *all* mental processes in the case of *all* men seem to follow the forms of existence and development summarized in the category itself. They are "necessary," both because they are original and universal, and also because we experience an irremovable limit when we seek to determine our own forms of conception in contradictory directions. All these tests, however, —and especially the latter two—are liable to be misunderstood and misapplied. For example, it may be said that all men do, and must, perceive and imagine sensuous objects as extended in space, and so that space may be, and must be, conceived of as the abstract possibility of the existence of extended objects. But that atoms do and must exist as extended in space; or that there is any extra-mental existence, ready-made, and spread out in three dimensions, which corresponds to the conception of space; or that the conception of space implies any such entity or form of real existence —all these are propositions which cannot be loaded upon psychology as though they were defensible by its scientific study of the phenomena of consciousness as such. *A fortiori*, do similar remarks apply to the category of causation.

§ 3. A full discussion of the categories would, of course, include others besides those mentioned particularly in this chapter, some of which will be referred to later on. But it is not our intention anywhere to attempt such a discussion. It will be seen, however, that the preceding remarks apply to them all, in so far as they are regarded from the psychological point of view. The so-called logical categories of "being," "relation," etc., for example, have plainly the nature belonging to all this class of conceptions. Intellectually considered they are of the most highly abstract order; but considered as capable of concrete illustration, they admit of the activity of the image-making faculty in an infinitely variable way. Every thing and every thought *is*, and is *related* to some other thing and thought. Therefore my conceptions of being and of relation are peculiarly content-less. And if I ask myself, whence do these conceptions come? the answer must be, I have been using thought reflectively, with a view to discover its own most fundamental forms of movement. My intellect has become, so to speak, very highly self-conscious, and has framed a conception of its own ultimate and most unanalyzable modes of behavior. And with the mysterious metaphysical faith which belongs to all its operations, it regards these categories, or universal and necessary predicaments, as the ultimate and necessary forms of reality.

The psychological discussion of Space considered as a category requires little in addition to what has already been said. In our study of the development of perception by the senses it was seen (p. 321 f.) that the problem of psychology concerns the stages by which, and the conditions on which, the various sensation-complexes become organized through intellectual activity into extended objects. It was then said that "for psychology empty space is itself only an abstraction, dependent upon a developed activity of the memory, imagination, and judgment, in connection with presentations of sense already acquired." The nature of this development of memory, imagination, and judgment has now been considered in detail, and its results have been noted in the largely changed character of the mental processes, the formation of faculty, the elaboration of experience, the construction of science, and indeed in the constituting of self-conscious *mind* itself. On the subject of space, then, it only remains to trace briefly certain main features in this process of so-called abstraction. It will thus be seen how developing intellect, on the basis of a growing experience with presentations of sense, draws conclusions as to the peculiar nature of the conception answering to this word.

§ 4. We resume the discussion substantially at the point at which it was left by Chapters XV. and XVI. Two classes of perceptions, or rather two highly elaborate systems of perceptions, originally belonging to different classes—the visual and the tactual—are now regarded as attained in their development, which is parallel in time; they supplement, assist, support, and correct each other. They are so mutually related and developed as that each is readily translatable, within given limits, into terms of the other. They are synthesized (on what condition and under what laws we shall see better later on) in our knowledge of "things;" but by that same activity of intellect which resulted in this synthesis, we can discriminate again the thing seen from the thing touched. Vague notions of direction, primarily assignable to the organs of hearing and smell, as the art of localizing the sensations of these senses is developed in dependence upon experience with sight and touch, gradually become more definite. In this way the general conception of *space, as distinguished from the sensuous intuition of extended objects*, is developed. "*Empty*," for the sense-organs of nose and ear, is all the space between the object which emits the odor or the sound and our own bodies. Indeed, since the greater number of our experiences with sounds and odors are not accompanied by visual or tactual presentations of the objects which occasion them, the experiences themselves seem to originate out of wholly empty space. As the air above us is empty to touch but not to sight, or the interior of our own bodies is empty to sight but not to touch, so is all space empty to smell and to hearing as such. Thus the blind person who should be at the same time deaf and deprived of smell, would necessarily be increasingly limited in his means for forming any conception of "empty

space." To such a one the world would probably have to be conceived of as solid and constricted in area, in a way quite inconceivable by us. But what would empty space be to one—if only such a being could live and develop at all—who was deprived of all means of moving his own body, or any of its members, and so of conceiving the existence of empty space on the basis of the tactual and muscular experience thus gained!

§ 5. The principal conceptions of spatial properties and spatial relations are gained, in the normal and more complete way, by conclusions from experiences with *both* sight *and* touch. This statement is true especially, however, of the more purely intellectual elements of the conceptions of this class. On the other hand, the more purely image-making work which enters into all such conceptions may be taken by one person chiefly from one of these forms of sensuous experience, by another person chiefly from some other form of experience. Suppose, for example, we ask, What is, considered psychologically,—that is, as actual mental performance—my conception of such spatial relations as "above," "below," "to the right," "to the left?" It will be found that the more abstract and free from dependence on concrete processes of image-making these conceptions have become, the more have the sensuous peculiarities of either of the two leading senses been left out, as it were. To one person, "above" is a certain direction in which the eyes move—this, as the sensuous basis for generalization. When we see one thing above another, then we always perform this complex act of vision by movement of the eyes in one (upward) direction. Our conception, then, may become merely that of a movement with the eyes executed in a certain direction—the particular character of the objects seen, as related, by this movement, being *abstracted*, that is, not being considered. But with another person a certain direction in which the arms are moved may have been the chief sensuous basis of the generalization. If, however, the conception answering to the word "above" is made yet more highly abstract, the particular organ moved in the direction indicated by the word may, in turn, be disregarded. And now the conception of this particular spatial relation becomes the conception of a relation as indicated by a certain direction of movement *merely;* and for realizing concretely this conception one may execute or imagine the movement with either eye or hand, as one chooses. In similar manner are our conceptions of certain other spatial relations attained. If, however, the conception to be found is like that indicated by the words—"to the right," or "to the left," etc.—movements of the head and trunk, together with reference to the position of hands or arms, are fittest to serve as the sensuous data for generalization; and faintly executed or imagined movements of the same complex character would probably furnish the needed concrete and lifelike realization of the conception. But the relation of all this process of abstraction to imagination, to the intellect, and to language, is precisely the same as that which we find in all our thinking.[1]

[1] Consider how our progressive construction of the conceptions of space, as applied to the body and through it to external things, depend upon what Häckel and others have called its obvious "isomeric structure." Its parts have "Spiegelverhältniss." N. B., the horizons of the different senses differ—touch corresponding chiefly to the dimension of *right* and *left*, and sight to those of *before* and *behind*. The former horizon has two equal halves; the latter has two unlike halves which are related as *light* to *darkness*, etc.

§ 6. The more elaborate so-called scientific conceptions answering to all possible spatial properties and relations are also formed in the manner already essentially explained. Space for the astronomer and for the child is the same ready-made spread-out extension, which *might be perceived* in all its three dimensions by the senses, and *is imagined* as a sort of entity having limitless expanse: that is to say, it is the space of sense-presentations and of sensuous imagination. Much less elementary and *naïve* is the space conception of the philosopher or the psychologist. But through the use of mathematics and the peculiar form of ratiocination which it encourages and employs, the scientific conceptions of spatial properties and spatial relations are extended vastly beyond the range of the popular conceptions. Thus it is a higher than the ordinary form of abstraction which results in the formation of those conceptions that geometry employs. The necessity for some special form of language in order to the successful accomplishment of such high tasks of intellect and imagination is met by the peculiar symbolism of mathematics. By the expert use of this symbolism whole groups of spatial properties and relations are summarized under a single sign; and in most reasoning about space-relations the mind really substitutes the mechanical relating of such signs for processes of ratiocination regarded as dealing with objects derived from real experiences of a sensuous origin. But every call to "realize" the meaning of the signs makes it evident that the conceptual processes of which the man of science is capable are essentially the same as those of his fellow who has had no scientific training.

§ 7. The process of "emptying" space of its concrete filling with extended objects has already been seen to differ with the different senses. The one common experience which most fosters, and indeed compels, this intellectual process is the experience of moving the body about freely, and of assuming different relations in extension to other bodies. This experience is, however, constantly assisted by another, which has substantially the same effect, namely, the experience of seeing and touching, in similar spatial relations to the same bodies, any number of different movable bodies. For example, the room is empty, when I can move about in it freely; and all those extensions are empty, however completely filled in the visual field they may be, through which I or any of my bodily members, or any thing, can be made to move freely. Even if I strike against a chair or table I can myself move it "out of the way;" and I can see or imagine its place in the system of related objects which the room contains, taken at another time by some other object. Now from the *concrete fact of occupancy* by particular tactually discernible objects which the spaces have, I may withdraw attention; thus I may form the conception of the *mere possibility, as such, of being occupied by some object.* Or again I may make a supreme generalization, as it were; I may form the conception *of the mere possibility of indefinite extension and possible occupancy in every direction.* Finally, I may employ the combined activity of constructive imagination in its most highly idealizing form, and of intellect, in order to *conceive*, as we say, of "pure and indefinite space." Such intellectual activity results in a concluding judgment which summarizes a vast amount of thinking in answer to the question, What is Space? But in the effort definitely to realize the meaning of this judgment, one may summon repeatedly to new exertions the image-making

faculty. One may imagine one's self where the remotest fixed star is, and more space lies beyond. One may imagine one's self in that beyond; and there is still more, farther beyond.

It was just said that, "finally," we attain this conception of pure and infinite space as the result of intellect and imagination dealing with sensuous data. These are not, however, *final words about* space. We have as yet reached only what Hegel was fond of calling the "figurate conception," answering to the term "category." We may then raise again the question, What *is* space; what is it *really?* We may employ in the supreme critical manner all our rational faculties to penetrate the mysteries of the being of the world and of our own mental life; we may answer: Space is but the form of our own perception and imagination, regarded as intellectual; space is the way of the human intellect in perceiving and conceiving things. Or we may affirm that space is some kind of extra-mental entity; and then proceed to discuss the question as to what kind of entity this so-called "space" can possibly be. But in even raising these inquiries we have already again passed over from the psychological domain into that of philosophy.

The mental procedure employed in the development of the conception of Time differs in no essential respects from that employed in the development of space-conceptions. There are, however, two subordinate and yet important points of difference: (1) The sensuous data, on the basis of which the mind operates in the development of its conceptions of temporal properties and relations differ in kind from those on which reposes the conception of space. Hearing, rather than touch or sight, has already been declared to be pre-eminently the time-sense. Yet all our sensuous experiences are events; and all events, as we significantly say, take place "in time." But, for the reason just mentioned, (2) the range of the applicability of the category of time is greater than that of space. Phenomena of consciousness, as such, are not extended; they have not *spatial* properties and *spatial* relations. But all changes, whether regarded objectively, as changes in the properties and relations of things, or regarded subjectively, under the head of phenomena of consciousness, as such, have *time*-properties and *time*-relations.

It has already been suggested that the one property—"time-wise," as it were—which all events are recognized as possessing, is *duration*. All events endure in greater or less degree; they are, therefore, measurable as respects their particular degree of duration, when compared with some common standard. The one relation—"time-wise"—of all events is *succession*. Here, as in the case of space, the development of the more abstract form of conceptions takes place as the result of the combined activity of imagination and intellect upon a basis of presentative experience. Here, also, the presentative experience itself is a mixture

of dim perception and obscure but stimulating affective phenomena.

The general character of the stream of consciousness must, furthermore, be considered as giving conditions to the development of the conception of time. It is for this very reason that our different states or fields of consciousness are thought of as existing in time-relations, and so as constituting what we figuratively call "a stream." But this stream of consciousness, as recognitive memory and intellect develop, becomes more and more a self-cognizing experience—a stream of self-conscious existence, in which all the different parts are not simply actually related in time, but are actually related with an accompanying consciousness of their relation by the subject of all the states which constitute the stream. Moreover, the very character of the stream of consciousness is such as frequently to set into bold relief the experiences that are favorable to the growth of the conception of time. For this stream is always, and necessarily, both discrete and continuous. Its varying content, its flow as a stream, is such as, at one instant, to emphasize the discreteness of different states and their time-relation to each other; and, at another instant, to emphasize rather the smooth continuous flow, or steady intense pressure, of single states. And here the manner of focusing and redistributing attention is all-important. For, as Dr. Ward says,[1] "attention does not move by hops from one definite spot to another, but by alternate diffusion and concentration, like the foot of a snail, which never leaves the surface it is traversing. . . . Thus our perception of a period of time is not comparable to so many terms in a series of finite units, any more than it is to a series of infinitesimals." Some forms of the movement of attention, however, are more favorable to the conception of single events as enduring "*through* time," and others are more favorable to the conception of the different relations of different events, "*in* time."

Three conceptions of the time-relations of all events may be enumerated; these are present, past, and future. It is measurement and the development of the mathematical use of imagination and intellect directed to the duration of events, which results in the formation of such conceptions as longer and shorter, or the definitely so long, in time. The formation of these conceptions, and their higher development, as well as the formation of the most abstract conceptions of so-called "empty" time, are all explained under psychological principles with which we are already familiar.

[1] Art. Psychology, Encyc. Brit., p. 66; comp. Spencer, Psychology, I., p. 402.

§ 8. The discussion left off at the close of chapter XIV. may be continued by assuming the existence of what is there called a "rudimentary time-consciousness." It is by the same combination of imaging and thinking, in which every conceptual process consists, that the vague consciousness of a "still-there" is converted into the conception of "the present;" the consciousness of the "now-going" or "just gone," into the conception of "the past;" and the consciousness of the "not-yet-there," with its affective accompaniment of expectation or dread, into the conception of "the future." In the earliest development, however, no definite conception of either present, past, or future, in general; and no conception of time, at large and equipped, as it were, with its three qualities, is presupposed. In the ordinary waking life of any child, the succession of presentations of sense, mingled with memory-images and with processes of constructive imagination anticipatory of coming events, flows on at a tolerably uniform rate of succession. Such a complex field of consciousness, then, really contains past, present, and future within itself. But at one time the child so buries itself in the content of some single experience—of peculiar interest, and without marked reference beyond itself—that the *present* is brought to a "sharper point,"[1] as it were, than is customary. At another time, what was just now a presentation of sense, with all its accompaniments of feeling, is chiefly noted as it fades away and becomes *past* before the mind's attentive eye. At still another time, the prominent object in the stream of consciousness is the vivid image of what is neither now presentation of sense, nor memory of what has already been; but is rather the expected or dreaded to be—the *future* hovering near. But all these forms of experience, however they may receive for a brief time the emphasis of concentrated attention, themselves pass away and dissolve in the relations which bind them as individuals to the contiguous moments of the onflowing stream of consciousness. They are themselves fitted, then, to be regarded as enduring psychical events that stand in the relations of present, past, or future to other psychical events.

Moreover, *as respects their contents simply*, all manner of events may stand in relations which, *as respects time-consciousness*, are to the intellect the same. At one time it is a presentation of sense that is present; at another it is an idea that is present, and sensuous objects are only remembered or anticipated. Again, it is feeling that is remembered or anticipated; or yet again, conation, with its stress of effort, is the present dominant mental fact. Furthermore, certain prevalent states of consciousness, or objects of sense attracting attention, may remain unchanged while the subordinate psychic elements or environing objects change in succession. Here the duration of the former class of psychoses constitutes a sort of background on which the succession of the latter records itself. For example: one is thinking continuously of home, while riding in a railway train with the sensuous "fringes of consciousness" fleeting and changing at every second. Or again, one is sitting by the sea and gazing fixedly at the same picture of nature; but meantime the images come and go as one recalls the past, or builds in anticipation a future cottage on this very spot. Such experiences afford stimulus and material for the intellectual task of framing the conceptions

[1] *Zugespitzt*, as Herbart would say: though such a thing as a "point" in the stream of consciousness is a pure abstraction—no reality.

of relations in time. "The before" and "the after," "the long" and "the short," in time are thus conceived of and understood.

§ 9. The development of time-conceptions cannot proceed far, however, without the assistance of language in summarizing and supporting the activity of intellect and imagination. Recognized objective standards for the measurement of time must also be introduced. "You have already had that pleasure once to-day;" "you did that same naughty thing yesterday;" "that happened when you were very young"—by such complex judgments do mothers train the time-consciousness of their offspring. Even more effectively is the childish appreciation of intervals and relations of time cultivated, when they are given "just so-much-time" to play, to pay a visit, to be shut up in the closet, etc. Nature marks off for all, in common ways, how they shall frame certain conceptions of time. Nevertheless, a day or a night is far from being the same thing for the inhabitant of the equatorial and the polar zones; and savages have conceptions of time-relations yet cruder than those of relations of space.

In brief, all conceptions of the relations of time imply developed activity of imagination and intellect; this development rests on a self-recognized continuity of consciousness in contrast to changeable objects of particular experiences; and this recognition is bound to memory, which combines "the before" and "the after" with one another, since, in reproducing what was earlier, it holds the consciousness fast to some objectivity or other. Thus, it may be said, that *the mind first perceives time, then constructs and rules time; and then, as we shall presently see, projects time as an entity and all-ruler of itself*.[1] Or, as has been well said, the succession of states in the flowing stream of consciousness is first dimly apprehended as *a* time; then conceived of as *my* time, or the time of *my* experiences; then, finally, it becomes time *in general*, from whose necessary form not even the Divine Being can escape.

§ 10. This last advance in the process of abstraction takes place in the following way. It is far more true of time than of space, that the conception of it as "empty" is a pure fiction. Some space is indeed empty to one form of sense-presentation, which is full to another form of sense-presentation; but the conception of empty time has no ground in any corresponding experience. For—we repeat again—all events are time-enduring; all experiences, whether of sense-presentation, or imagination, or memory, or thought, are processes in time. The consciousness of these processes is a process in time; the time-consciousness, however far developed as conception, is itself a process in time. Our conception of empty time is not, then, precisely the correlative of our conception of empty space. We have certain experiences, however, where a moderate monotony and tediousness characterizes the subjective series; while some objective standard marks off into regular divisions the time during which the series lasts. At the end of such a period we may sum up the whole experience as so much time (measured by some objective standard) during which *we* have thought and felt little or nothing—time, that is, which we cannot remember to have been filled with any particular content of experience. Thus we wake from the dull day-dreaming, from the condition of *dolce far niente*, from the prolonged loaf-

[1] Comp. George, Psychologie, p. 268.

ing by the sea-shore, with the exclamation: "How much more time than I thought (than seems content-ful) has gone!" The same mental representation is heightened when, on waking after a good night's rest, we perceive by objective signs how much time has lapsed, but can supply no content from the stores of memory with which to occupy it. A yet higher degree of developed imagination enables us to project into the future the picture of time running on and on, as we say—so many myriads of years; and yet we, perhaps, as a stream of consciousness not filling it up with experiences like those remembered from our past. In this way a vague conception of *mere* time, of time that is simply *time*, and content-less, may be framed. It is, of course, a psychological fiction, and the very reverse of the psychological reality, to regard such empty time as though it were either the actual or the logical *prius* of our time-experience.

The actual mental process which answers to the words "infinite time," is a still more abstract and purely negative form of conception. For here the thought-element of the process consists in judging that *no* end is to be predicated of this time; while the element of imagination consists in repeatedly ideating some—as objectively measured—immense stretch of time; and then another, and yet another, and so on. The resulting conception (?) of infinite time is a final return to negative judgment, with vague affective accompaniments of exhaustion, impotency, and, perhaps, also incomprehensible sublimity, etc. Indeed, what is called the conception of the "infinite," whether as applied to space or to time, is very largely a semi-æsthetical feeling, or vague sentiment, as it were.

§ 11. It is scarcely necessary to observe again the very powerful influence which feeling has over all our conceptions of time. How time "gallops with the thief to the gallows," and "stays still" with the lawyer during vacation, poets and philosophers have not been the only ones to notice. Science even is obliged to recognize the influence of feeling on all its most carefully guarded estimates of time. Indeed, without the means of checking and limiting these effects by increased accuracy in the application of objective standards, such a thing as modern science could scarcely exist at all.

In dependence upon conceptions of space and time, certain other subordinate conceptions undergo a corresponding development. Most important among these are the conceptions of Motion and Number. Both these conceptions involve both space and time. Sensations and primary perceptions of motion are among the earliest products of the activity of the psychophysical organism; without them it is not simply true that intellectual advance is impossible; it is rather true that existence itself is impossible. But for the development of the more definite and complex conceptions of motion—of the direction, amount, and time-rate of change of place—both space-consciousness and time-consciousness must advance with nearly equal step. Number, again, is a conception which requires for its development the higher activities of both imagination and intellect;

and of these faculties as dealing with both space-relations and time-relations. The one essential process here is—as we have already remarked (p. 475)—counting. What is counted, however, must be regarded as separable, discrete, in space and time. One thing is in this place, and the second thing is contiguous to it in space; and so on. Or, this event happens at this moment of time, and the other and second event at another moment of time; and so on. Memory and imagination must bind together every spatial series and every temporal series; and both these faculties act in time.

§ 12. According to the very interesting view of Trendelenburg,[1] motion is a sort of common vehicle for all our conceptions of space and time. There is a certain truth in this view. On the other hand, it is also true that the conception of motion itself implies a certain development of the conceptions of both space and time. "Direction" of motion is conceived of only as a generalization from our experiences of bodies changing their spatial relations to other bodies, in the succession of time. All our conceptions of the relative amounts of motion—and this includes all our standards for measurement of physical changes, and all our objective standards for measuring psychical events—depend on conceptions of both space and time. With this is, of course, connected the question of time-rate.

In considering the development of genuine conceptions of number, as distinguished from sensuous and intuitive estimates of gross amount (see p. 299), it is interesting to notice how the mind proceeds.[2] As we measure, we count. In the simpler forms of measurement, we lay down a rule, repeatedly, beside the thing to be measured; or we pace it off; or we apply our fingers or fore-arms to it, or mark it off with the eye. Every time we repeat the application of the standard of measurement, we note down (either mentally, or with chalk or pencil) a unit; and then we synthesize, and judge "so many" to be the result. In each of these processes, some development of both classes of conceptions, those of spatial properties and relations, and those of duration and succession in time, are plainly involved.

It has long been customary for psychology and philosophy to treat the Conception of Causation as though it were a simple and unanalyzable conception, like the conception of time or of space—a "category," in the sense in which they are categories.

The bearing of this mistake upon one's theory of knowledge and upon one's philosophy of ethics does not, of course, concern

[1] Logische Untersuchungen, I., chaps. v. and viii.

[2] This distinction may be illustrated by the way in which adult experience often vacillates between more or less vague impressions of number and definite acts of counting. For example, the clock has struck four times, and I have heard but have not counted. The terminal condition of consciousness differs, in case the clock has struck only once, from that induced by two strokes, or by ten strokes, of the same clock. By immediate though trained self-consciousness I can analyze this terminal state, and then *know how many* times the clock has struck. Or, suppose I have kept count of the strokes; here the process is plain. Or both: suppose I began to count—say "four," with the impression, derived from my complex of sound-consciousness, that the clock had already struck *three* times, etc.

us here. But its refutation on psychological grounds is indubitable. Let it be borne in mind, however, that the psychological question is not, What is it to *be* a cause? or, Are things *really* causally related? but rather, What are the actual processes in consciousness which answer to the so-called *conception* of cause; and how do we *develop* this conception?

Now, the conception which answers to the term causation is, on analysis, actually found to be a very complex conception. Causation is, psychologically considered, not so much a single category as it is significant of conclusions that involve the foundation and mental grouping together of a number of conceptions, each one of which is often, separately considered, called a category. By this it is not meant simply that different minds concretely realize this conception in widely different ways, as is the case with the conceptions of space and time. On the contrary, so far as image-making activity enters into the conception of causation, the form of such activity is pretty strictly alike for all individuals. And this common form of imaging the so-called category of cause is instructive, as respects the nature and origin of the conception itself. Now, what we do all actually experience in trying to get a "life-like idea" of the meaning of our judgment—"A is the cause of B," is *the process of mentally representing our own experience, whenever self-conscious conation, with its feeling of effort, is followed by observed changes in our presentations of sense, in a regular way.* That is to say, it is consciousness of the sequence of willing, saturated—as it is—with its accompanying sensations and feelings of both peripheral and central origin, which is evoked by the wish to realize the meaning of the word "cause." And, in truth, no other way can be found of accomplishing the wish to make life-like this particular idea. On the contrary, we have already remarked in what a variety of ways the relations of space may be imaged.

But, if the imaginative and sensuous basis of the conception of causation is comparatively simple and uniform, its more purely intellectual elements are exceedingly complex. To test this, suppose we endeavor to express in separate judgments the conception we have formed of causation, as such. If causation were a genuine category, as space and time are categories, this would be impossible. Of space and time we cannot say I judge that "to be space" or "to be time," is—etc.; that is to say, we can neither describe nor define space and time by other notions. But we may say (whether perfectly correctly or not, we do not now inquire), I judge that, "to be a cause," is for one being to act in such a way as that a change in some other being follows,

the latter occurring in dependence upon the former for its explanation or ground. But what a nest of complex conceptions is involved in such a judgment as this! Some of them, at least, are much more nearly fundamental and simple than is the conception of cause. For example, the conceptions of Being, Action, Relation, Time, and Reason or Ground, are all plainly involved in the foregoing judgment. Others, such as Unity, Identity, and even contiguity in space, and priority in time, seem also to be involved. But, as Dr. Ward[1] has correctly maintained: "Action is a simpler notion than causation and inexplicable by it." Now, of course, action, without a being that acts, is an absurdity. Being, too, then, would seem a simpler notion than causation. Moreover, Relation (whether causal, or merely in space or in time) is also a simpler notion than that of causation. Nor will it do to say that the notion of "standing in the relation of Reason or Ground" *is* identical with that very simple and unanalyzable notion of causation which we seek; for we have already seen that this notion is itself abstracted from the form of intellectual movement in all ratiocination. Moreover it applies to relations between conclusions and their major and minor premises, whereas the relation of causation applies to changes in real beings. The notions of ground, and dependence on ground, are then also simpler and more fundamental than the conception of causation.

The fact is that, in trying to account for the origin and development of the so-called category of causation we have to draw, as it were, upon all the areas of experience. The conception arises and develops as the resultant of all our efforts to explain experience. *The only thing distinctively categorical* (that is, original, universal, and necessary) *about the conception of causation is just this native and essential impulse of intellect to explain.* Explain! and yet further explain!—this is, indeed, the law of our development as reasoning beings. It is our experience with ourselves as active and passive, an experience that is most immediate and most interesting, which offers itself as an analogy fit for all explanation. When *we act*, by way of conscious conation and muscular effort, then changed presentations of sense follow; and *vice versa*, when certain presentations of sense indicative of certain relations of other beings to us occur, then *we suffer* certain conspicuous changes in the content of consciousness. *It is the projection of our experience with ourselves into the world of related things, under the impulse of the intellectual demand for explanation, which results in the general notion of causation.* All this takes

[1] Article Psychology, Encyc. Brit., p. 83.

place long previous to any suspicion even that we are apprehending a universal law of the world of real events.

The superstructure of so-called *a priori* knowledge, or assumption, which modern science has built upon the principle of causation is, at least psychologically considered, utterly indefensible. We do not naturally or necessarily believe—much less know—either the permanency of matter or of force in the physical universe, or the truth of the judgments ;—"Every event must have a cause." But we do, as reason develops, seek constantly more adequately to explain; and we explain on a hypothesis which results from our attributing to the world of things the same kind of relations which we perceive ourselves sustaining to it. To be a cause is "for one being to do something to some other being," as we might popularly say. Conceptions, like those of the universal reign of law, of the unity of matter and force, or the regularity and uniformity of nature, etc., are all a later and yet more highly complex development. These never are, and never can be, psychologically considered, anything more than hypotheses introduced by intellect in the interests of a more complete unification of experience.

Finally, that conception of causation which modern science has enabled us to develop is still less life-like as a matter of imagination, and still more abstract as a matter of intellect. The scientific study of nature induces the feeling that we are unwarranted in attributing to things a kind of relation which we can concretely realize only in terms of our own conation and feeling of effort, followed regularly by changes in presentations of sense. This is to regard nature, we are told, in altogether too "anthropomorphic" a fashion. What science then does is to extend the more purely thought-elements of this conception. In doing this, however, we are in some sort, no less anthropomorphic. Only *we now attribute the laws of intellection*—that is, the forms of thinking which connect conclusions with judgments as finding in them their "reason" and "ground"—*to the behavior of things.* Treated thus, the conception of causation loses all its concrete life-likeness, and becomes a pale abstraction which answers to some such postulate as that "every event follows some other event according to some uniform rule." Yet even here, however much the effort may be made to escape it, conceptions which have their origin in our universal experience with ourselves constitute all the reality of that thinking which answers to the Principle of Causation. In how far these psychological facts bear valid testimony to the general postulate or conclusion, that the real world is indeed rational, and that reality answers to

human reason in its constitution—it belongs to philosophy to inquire.

§ 13. Only scant study of consciousness is needed to reveal the baffling complexity of men's thinking, when they so glibly use that cluster of expressive terms which is connected with the term causation. This fact is most evident with those who are farthest advanced in the conceptions which enter into the modern developments of the natural sciences. The physicist is far less able to tell what that is real he means, when he speaks of energy as "conserved" and "correlated," or the chemist when he declares that atoms of one element "attract" those of another element, than is the unscientific observer when he speaks of the "influence" which one thing has "over" another, or of the "action" of one thing "upon" another. In all cases of alleged causation it is evident that, psychologically considered, we are dealing with the results of the entire complex growth of knowledge; and thus our attention is called to the important truth, that it is impossible to speak of the conception of causation without implying that the stage of *knowledge*—as the complex resultant of the development of all faculty—has already been attained. For it is real beings, as *known* to exist and to behave in manifold relations of time and space toward each other, that are conceived of as causally connected. As we shall see later on, *it is our belief in such connected and interdependent existences, which is chiefly necessary in order that thinking may end in knowledge.*

Certain lower and non-intellectual activities of the mind may be considered as subservient to the development of the complex conception of causation; although of themselves unable to account for its development. This is true even of the instinctive imitative and the sensory-reflex classes of psycho-physical activities. By such activities our own psychoses are, both actively and passively, connected together in consciousness; and these, as known in self-consciousness, are connected with those psychoses which we have learned to attribute to other beings than ourselves. Especially does every painful or pleasurable sensory-motor experience stimulate our inquiry and interest in drawing conclusions as to its cause. The sensations of the pricking pin, the chafed skin, the cold milk, set agoing in the infant a variety of motor reactions, some one of which may result in either relieving or increasing the pain. Every such experience emphasizes a connection between doing something, or not doing it, and certain definite pleasurable or painful consequences. Growing intelligence—that is memory, imagination, and thought—puts the child in possession of precisely what to do, or what not to do, in order to gain pleasure or to avoid and relieve pain. Thus all its awakening desires serve as a sort of interior pressure upon the motor organism; they constitute an almost ceaseless invitation and compulsion to the doing or to the avoiding of this or of that. Imitation, too—at first blind and instinctive, and afterward more purposeful and intelligent—establishes other connections between what is done by the child and what is more passively experienced. Thus it is that one chief impetus to establish regular connections arises. Indeed, *it is in the use of the muscles, as dependent upon conation and in association with the feeling of effort and with various forms of pleasurable and painful feeling, that the conception of causation has its birth-*

place, so to speak. Certainly, mere observation of the uniform sequences of images under the laws of association of ideas would never serve to develop this conception; only as being ourselves self-conscious agents and sufferers do we come to argue about "energy" and "causation" in the world of *things.* Here, as so frequently in other directions, psychology has hitherto greatly underestimated the significance of motor consciousness, and its connection with the system of striated muscles, together with the accompaniment of bodily feelings having tones of pleasure or of pain.[1]

§ 14. All the language of child-life and of the common people confirms the truth of our view of the so-called category of causation. It is only when the child has developed a somewhat complex knowledge of itself as a being that can do something, and by doing can attain its purposes in changing the relations, to itself and to one another, of external things, that it begins to use terms implying the dawning conception of causation. The development also of this conception is dependent upon the development of the consciousness of Self. In proof we adduce the following lengthy quotation from Preyer:[2] "Another important factor is *the perception of a change produced by one's own activity* in all sorts of familiar objects that can be taken hold of in the neighborhood; and the most remarkable day, from a psycho-genetic point of view, in any case an extremely significant day in the life of the infant, is the one in which he first experiences *the connection of a movement executed by himself with a sense-impression following upon it.* The noise that comes from the tearing and crumpling of paper is as yet unknown to the child. He discovers (in the fifth month) the fact that he himself in tearing paper into smaller and smaller pieces has again and again the new sound-sensation, and he repeats the experiment day by day and with a strain of exertion until this connection has lost the charm of novelty. At present there is not, indeed, as yet any clear insight into the *nexus* of cause; but the child has now had the experience that he can himself be the cause of a combined perception of sight and sound regularly, to the extent that when he tears the paper there appears, on the one hand, the lessening in size; on the other hand, the noise. The patience with which this occupation—from the forty-fifth to the fifty-fifth week especially—is continued with pleasure is explained by the gratification at being a cause, at the perception that so striking a transformation as that of the newspaper into fragments has been effected by means of his own activity. Other occupations of this sort, which are taken up again and again with a persistency incomprehensible to an adult, are the shaking of a bunch of keys, the opening and closing of a box or purse (thirteenth month); the pulling out and emptying, and then the filling and pushing in of a table-drawer; the heaping up and strewing about of garden-mould or gravel; the tearing of the leaves of a book (thirteenth to nineteenth month); digging and scraping in the sand; the carrying of foot-stools hither and thither; the placing of shells, stones, or buttons in rows (twenty-first month); pouring water into and out of bottles, cups, watering-

[1] Horwicz (Psychologische Analysen, ii., p. 93) holds that the act of will by means of which our muscles contract is the earliest object of our cognition. This act of will, with the movement willed which follows upon it, is the center and germ of cognition, and the kernel of causality, although not the developed concept of causality. In its purest form, therefore, the relation of causality is given in the relation of sensation-movement.

[2] The Mind of the Child, II., The Development of the Intellect, p. 191 f.

pots (thirty-first to thirty-third month); and, in the case of my boy, the throwing of stones into the water. A little girl in the eleventh month found her chief pleasure in 'rummaging' with trifles in drawers and little boxes. Her sister 'played' with all sorts of things, taking an interest in dolls and pictures in the tenth month. Here, too, the eagerness and seriousness with which such apparently aimless movements are performed is remarkable. The satisfaction they afford must be very great, and it probably has its basis in the feeling of his own power generated by the movements originated by the child himself (changes of place, of position, of form) and in the proud feeling of being a cause."

§ 15. The next stage in the development of the conception of causation is chiefly dependent upon experience with those beings, other than himself, which promptly react upon the child and cause him feelings of pleasure or pain. One important class of such beings is the animals—especially, of course, the domestic animals with which he becomes most familiar; and above all, his fellow human beings. The bearing of such experiences is made plain in sentences like the following: "I kicked the dog and the dog bit me;" "I hit the boy and he hit me back," etc. Here "the principle of causation" is illustrated in double form, as it were—both as consciousness of motive and consciousness of energy, followed by important changes in presentation-experience. In such experiences the basis in sense and imagination for that act of intellectual projection which creates out of the object of sense an acting agent like myself is abundantly supplied. From such experiences it is but a step to the attribution of causal agency to all things that manifest signs of life. Feelings and desires are ascribed to inanimate objects as inner *motifs* for their changes as presentations of sense. Not only the animals, but even the plants, are sympathetically apprehended as agents that exert themselves and produce effects upon one another. Next the phenomena of nature, like thunder and lightning, or volcanic eruptions, or sudden pestilence, are assigned to unseen agents imagined to exist and to act after the pattern suggested by the self-knowledge already obtained. The psychical life of children and of savages abounds in illustrations of such "anthropomorphic" causal conceptions. Inorganic things that act promptly and intensely upon us, or by the use of which as instruments we effect our ends, are similarly regarded. "The poker *makes* the fire burn;" and, if the poker is of wood, "the fire *burns* the poker up;" but if the poker is of iron, then "the fire *makes* it red," etc. To quote again from Dr. Ward:[1] "When we say *A* causes this or that in *B* we project, or analogically attribute to *A* what we experience in acting, and to *B* what we experience in being acted upon;" and this "long before we suspect that this relation is a permanent one or must recur again."

§ 16. It is by the development of experience under the principle of the association of ideas that, in large part, we are determined as to *what changes* in *B* shall be attributed to antecedent or concomitant changes in *A*, as their "causes." It is under the same principle that the connections of the past are made to furnish rules for expectation as to the behavior of things in the future. All our conceptions of things summarize the judgments of our experience with the individuals of the class to which the things belong. We

[1] Art. Psychology, Encyc. Brit., p. 82.

judge things to belong to classes, and to be entitled to names, according as they have behaved themselves in definite relations to other things. The child's conception of a dog is largely made up of what the dog can do; and this is the same thing as to say that the dog is known as a cause of various agreeable and disagreeable experiences. New experiences constantly confirm, or break up and readjust, the old associations; but the law of associative reproduction remains the same throughout all our development. Thus, instead of stating the so-called law—"Like causes have like effects"—it would accord with the facts of consciousness better to say: "The same beings may be expected to behave in the same way under similar circumstances;" or, more doubtfully, "New and unknown things may be expected to behave, under the same circumstances, in a way similar to those known things which they most resemble." "Associations remain what they are so long as they remain at all."[1] Upon some such impression as this concerning the "uniformity of nature" our safety and very life daily depend. The impression may be said to be "rubbed in" to the very texture of skin and muscles and joints and bones. Beware of snarling dogs, of falling stones, of blazing fire, of sharp knives, of bright lightning, of deep, swift currents, etc.; one experience with these agents is enough to know what they will do; custom established by repetition is not necessary here.

§ 17. But association of ideas, working upon the basis of our experience with ourselves as agents, and resulting in an analogical projection of this experience upon all other things, is not alone a satisfactory guide in determining what changes in *A* cause this or that particular change in *B*. This is rather an inquiry in which *intellect*, as applied to reality, chiefly exercises itself; and it is conducted by those processes of reasoning which, if successfully concluded, result in science as explanatory of the world of events in their causal relations. In this way *all events are regarded as having their ground in other events, and these other events in still others—under the influence of that demand for explanation in the interests of a progressive unification of experience which is the law of the very life and growth of intellect itself.* It is this intellectual necessity to explain—we repeat—that gives to the so-called law of causation the necessity with which it appears to rule the world of things. At any rate, such is the last word which psychology can utter upon the subject. It must be left to philosophy to show that in its supreme scientific form the conception of causation implies the confidence of the mind that the world of real things and real events *is* an intellectual order; and that, in knowing it under the general principle of causation, mind is recognizing its own forms of behavior in the behavior of things.

[On Space and Time, see the works already referred to in the chapters on Perception. Also Hodgson: Time and Space, chaps. ii.–iv. Nichols: The Psychology of Time. Vierordt: Der Zeitsinn; and articles in Mind, by Montgomery, x., pp. 297, 377, and 512; by Hall, iii., p. 433; by Sully, iii., pp. 1 and 167. On the psychological development of Causation, see especially the article of Ward, already referred to, Encyc. Brit., xx., p. 82 f. Höffding: Psychology, v., 4. Porter: The Human Intellect, p. 569 f. Venn: Empirical Logic, chap. ii. Further philosophical discussion of these topics has an almost unlimited bibliography.]

[1] Comp. Lipps, Grundtatsachen d. Seelenlebens, p. 488.

CHAPTER XXII.

THE KNOWLEDGE OF THINGS AND THE KNOWLEDGE OF SELF

THE complex resultant, as it were, of all forms of mental development, considered chiefly on the side of intellection and logical conclusion, is called "Cognition" or "Knowledge." But knowledge may be regarded, from the psychological point of view, as either a process or a product. When, however, we speak of knowledge as "product," we enact a fiction in speech with which we have already become sufficiently familiar. What is really only a process is described as a mental entity. Since we may condense into an almost instantaneous process, into a brief moment of thoughtful perception or familiar conclusion, stated in a verbal proposition, the results of long processes of observation, inquiry, and reasoning, we may call such a condensed process the product of knowledge. It is only as a complex psychosis, a state of consciousness resultant from the combined activity of various developed so-called faculties, however, that scientific psychology studies the phenomena of cognition.

We are forced to recognize, at the outset, the fact that all our psychological inquiry, as thus far conducted, has assumed the existence and the validity of knowledge. We have been building up a science of psychology on the basis of an assumed knowledge of certain facts and laws. But the present object of special psychological investigation is knowledge itself; we now seek to know what knowledge is. As says Professor James:[1] "The *relation of knowing* is the most mysterious thing in the world. . . . Knowledge becomes for him (the psychologist) an ultimate relation that must be admitted, whether it be explained or not, just like difference or resemblance, which no one seeks to explain." We may partially agree with some such statement as the foregoing; but we cannot sympathize with any effort to discharge psychology from the obligation to treat those psychoses, or complex mental processes, which deserve the name of knowledge, just as all other psychoses are to be

[1] The Principles of Psychology, I., p. 216.

treated. This treatment involves the analysis of knowledge into its more elementary processes, and the tracing of its genesis and development under the general conditions of all mental life.

Two important general considerations — almost uniformly overlooked by psychologists—concern the scientific description of cognitive states of consciousness: (1) They are reached as the result of a course of development. *From the psychological point of view knowledge is a development.* It has a growth and a descriptive history of such growth. Such a statement applies, not simply or chiefly to the evolution of the higher stages or more elaborate forms of knowledge, but to all knowledge and to the very faculty of knowledge as such. Human mental life does not begin with knowledge; it not only grows *in* knowledge, when knowledge is once attained, but it grows *into* knowledge only when certain conditions are fulfilled. The stages and conditions of this development may be made the subjects of scientific investigation. (2) *This particular development, which we call "knowledge," involves all the activities of the mind.* It involves them all, in a developed form of exercise, and in a certain natural harmony of their coetaneous action. To be sure, the terms we employ lay emphasis chiefly on one of the three fundamental aspects of mental life, to the relative exclusion of the other two; on that account it is quite too frequently assumed that feeling and willing are not necessary and integral processes in knowledge, but that knowledge is an affair of intellect alone. This, however, is not true. Were man not a being of so peculiar affective and conative consciousness, and were not the so-called faculties of feeling and willing developed in some sort *pari passu* with the development of primary intellection, human knowledge would never come into existence at all.

§ 1. There are two equally false and misleading ways of considering the phenomena of knowledge in relation to the doctrine of evolution. On the one hand, it may be assumed that mere analysis of the so-called content of an act of knowledge, or description of the processes of sensation and ideation which develop in natural order, afford a solution of "the mystery of knowledge." Then psychology would leave nothing for philosophy to do. On the other hand, it may be assumed that knowledge actually breaks forth in the mind of the child by a sort of miraculous birth—that it is, as respects nature, simple, indecomposable, and so not capable of scientific explanation at all. Both assumptions are indefensible.

That the amount of knowledge belonging to any individual, or to the race at any particular epoch, is a matter of development, there is no need to prove. But that all knowledge, as such, implies development is a truth

not sufficiently emphasized by psychology hitherto. It is a truth, however, which is popularly recognized by any observer who remarks that babies "do not know anything." For, indeed, at first and for a considerable but indefinite time after birth, the child has no such development of any faculty as to make knowledge possible. To it there is no "Thing" known; to it there is no "Self" as an object of knowledge. This is, however, far from affirming that the child has no states of consciousness whatever—no sensations, no mental images, no feelings, no conation and motor consciousness. Even a considerable development of discriminating consciousness, as the inseparable accompaniment and indispensable condition of all mental development, may take place before the first act, or process, worthy to be called knowledge is reached. The fact that this development *into* knowledge is so subtile, and comes by such stages as to make it impossible ordinarily to trace the *first* act of knowledge, is a fact which favors rather than contradicts the view of all knowledge as the result of development.

§ 2. There is no generally recognized word to cover all that "aspect" of consciousness, that side of mental activity and development which is neither feeling nor will. The word "knowledge" has itself, indeed, been used in this way. The phrase "primary intellection" has been used thus far by us as expressive of all processes ending in recognition of the similar and in discernment of the different. But "intellect" has also been used in a more restricted way, as the faculty of thinking, and especially of drawing logical conclusions.

Now the very fact that knowing is, by modern psychology, so commonly correlated with feeling and willing, and that the three are held to exhaust all the aspects of all our states of consciousness, shows that knowledge implies the exercise of every form of intellectual activity. Knowledge implies the having of sensations, and the mental act of discriminating among them; but to know is something more than merely to be sensuously affected in various discriminable ways. Knowledge also implies memory and imagination; but to know is not merely to have mental images, whether identified or not with previous presentative experience. Again, no knowledge is possible unless the faculty of judgment is operative; unless relating activity, which is of the very essence of knowledge, is prominent in the psychical process. And yet we rightly distinguish between the most elaborate and highly developed logical thinking, and what we call knowledge of things or of self. Not the simplest act of knowledge can rest upon logical conclusion alone. It is obvious, then, *that cognition involves the combined activity and development of all "intellective"* (if this word may be used in so general a significance) *faculty.*

§ 3. The important part which feeling plays in all knowledge has seldom received recognition from students of psychology. Knowledge certainly is not mere intellection; to know one must be consciously affected with various forms of feeling, having their varying tones of pleasure and pain. By this it is not meant simply that one's emotions and sentiments profoundly influence one's cognitions, although this truth is enforced and consecrated by innumerable practical maxims, by the rules of artistic composition, and by our daily experience. That the lover cannot see his mistress's imperfections, or the fond mother the faults of her child; that poli-

ticians, lawyers, and even judges, are warped in judgment by feelings of attraction and repulsion toward individuals or by passion-bound adherence to abstract propositions; that even the most careful scientific observers have constantly to guard themselves against judging that what they see through the microscope or telescope really is what they expect or desire it to be;—all these experiences are familiar enough.[1] Nor does such feeling always operate upon the intellect by an influence that is separable in time. On the contrary, the real and total fact is that the thing is *known* to be what it is both *felt* and *judged* to be. And how could this be otherwise, since it is the total psychosis, not only as intellective but also as affective, which determines knowledge.

The influence of feeling on intellect is not, then, influence merely from one faculty upon another external to it, as it were. The rather do *the so-called faculties of intellect and feeling blend in all cognition, and the complex result—the very object of knowledge—is determined by both.* This truth is further illustrated by all experimental psychology, which points out the effect of expectation, surprise, interest, and other of the many most primary forms of feeling, upon perception and upon the association of ideas. Stimulations of sense, essentially similar as respects their purely sensuous character, result in different objects being known, according as fear, or hope, or joy, or grief, or anger, are dominant in the mind. The psychology of hypnotic subjects is full of illustrations of the same principle. Not only does the hallucination produced by suggestion stir the proper accompaniment of feeling, but the feeling when itself stirred by suggestion directs and determines the hallucination. Thus the feeling of helplessness makes the weight to be perceived heavy; the feeling of disgust or shrinking makes the object to be known as ugly or fearful; the feeling of expectation of a sour or inky taste, of unbearable heat or cold, etc., "realizes" itself, as we so expressively declare. It is of no use to say, in the effort to break the force of this argument, that we are here dealing with phenomena of illusion and hallucination rather than of knowledge, and with the activity of imagination rather than of intellect. *Psychologically* considered, the extra-mental validity of the act of knowledge has nothing whatever to do with our question; for from the psychological point of view all knowing is subjective, is considered to be "state of consciousness, as such,"—even that which thinks itself entitled to universal acceptance as scientifically most

[1] How thoroughly feeling is apt to penetrate and influence even those preliminary processes of the "observation of *facts* (?)" on which the cherished theories of science repose, is illustrated in a very forceful way by the investigations of Professor Alpheus Hyatt into the fossils of the sand-pits of Steinheim. Dr. Hilgendorf and other German authorities had found in these fossils such a complete series of genetically connected forms, so arranged in the succeeding strata, as to seem to constitute "a perfect demonstration in the concrete of the theory of the transmutation of species." This demonstration Professor Hyatt hoped and expected to find. But on taking pains "to avoid seeing by preference, and involuntarily selecting the things which were forecast in his own mind," the "*facts*" themselves were found to be far different from what they had "honestly" been misrepresented as being; and the observer found himself "rightly and legitimately disappointed" in his hope of a demonstration of current theory. "My Steinheim work convinced me," says Professor Hyatt (I quote from a written communication), "that even the honest observer might be misled into picking out specimens favorable to his own views, if the exceptions were rare enough to be difficult to find or lost in a multitude of forms that were forecast in the observer's mind." The bearing of this upon the true psychological theory of knowledge is obvious enough.

conclusive. Nor are trained men of science without their hallucinations due to the suggestion of feeling: witness the physicist who perceived the really light-weight metal potassium to be very heavy; or the one who distinctly heard the clock ticking through the vacuum because his old-fashioned theory of sound led him to wish it so; or the other, who observed the products of spontaneous generation in a thoroughly sterilized medium! Neither knowledge by immediate perception, nor knowledge by carefully guarded inference, can be wholly freed from the results of that emotional energy which is put into it. Moreover, the assumption that knowledge, if it could be purified from *all* feeling, would give us the reality of things, is a fallacious assumption. Mathematics (especially such as is technically called "pure") is of all the sciences most completely freed from any mixture of affective accompaniment. At the same time this science is most removed from all *real knowledge*—in a most important meaning of the word "real." By pure mathematics alone, and its "unfeeling" observation and ratiocination, we never come to know any real "Thing," much less our real "Self." How necessary feeling is to an understanding of the lower animals and of men (even as objects of the most "objective" kind of knowledge) it is not difficult to show. "Art," it has been said, "knows the animals as they are; science only as they appear."[1] We have already seen (p. 490) that Lotze maintains the knowledge of spatial relations which women possess to be largely a matter of feeling. But to similar considerations we shall return when speaking of "tact;" and to philosophy we commend the inquiry whether the real world *is* any less a matter of feeling than it is of force, law, order, and other similar predicates.

§ 4. Pre-eminently true is it that we must strive and do, must will and realize the results of conation, if we are to gain and to develop knowledge. The psychology of attention (see p. 75 f.) as the determiner and director of all knowledge, suggests this truth. The modern principle of pedagogy which attaches so much importance, in developing the child's knowledge, to the arousement and discipline of striated muscle and motor consciousness, emphasizes the same truth. Any one of us may experience it concretely by answering the challenge which every *real* object of sense-perception offers to us: "Do you wish to *know* (not opine, or guess, or speculatively think) that I am and what I am; then come and try your will against me" (comp. p. 343 f.). The same thing is true of self-knowledge. As says Göthe: "How can a man learn to know himself? By reflection never, only by action." Pale images and dreams, or abstract thoughts about such dreamlike things, is all that sensation and intellect could give us, if we were not beings of will standing in immediate relations to a complicated muscular system. Indeed *it is largely if not chiefly, by willing and experiencing the reactionary effects of willing, that we have any knowledge of either Things or Self.*

But there is a mysterious form of mentality involved in the existence and development of knowledge, to which it is particularly difficult to give scientific treatment. Indeed, it is difficult even to find a satisfactory name for this mental procedure; or if some name is agreed upon, to agree upon the class of mental

[1] Comp. Ballauff: Elemente d. Psychologie, p. 189 f.

phenomena—thinking, feeling, or willing—to which it belongs. To speak of it as *a* thought, *a* feeling, *a* volition, would seem to imply the possibility of comparing it with other particular thoughts, feelings, or volitions. And yet it is necessary for psychology to recognize its presence, while to philosophy it affords problems for seemingly endless debate. We shall speak of this form of mental procedure as a *Belief in Reality;* and shall regard it as more nearly akin to feeling than to either thinking or willing.

There can be no doubt of the fact that knowledge involves belief in reality; and it is just this which chiefly distinguishes knowledge from mere imagining, remembering, or thinking, as such. When we *know* any object, it is not merely as "object" for the knowing process, but as a "being" existing in some state, that we know it. When the belief or conviction attaching itself, as it were, to the reality of the being becomes sufficiently clear and strong, then one may say: I *know* the object; and may say this with an emphasis bearing some proportion to the strength of the belief. If, then, it were our purpose to treat of knowledge philosophically, we might go on to show how Knowledge and Being are necessary correlates; and to examine critically the nature of knowledge and the conception of reality in order to discover how each implies and validates the other. But the merely psychological treatment of knowledge leads us to note how knowledge differs from all other more partial and individual psychical processes, in that it not only involves them all, but also involves this fundamental belief in reality. The specific character of this belief, in contrast with other beliefs, may be brought out by calling it "metaphysical." And since it is not a particular acquired belief, but belongs to the very nature of knowledge, as such, it may be called "rational" and instinctive. In brief, then, *without this rational and yet instinctive (?) metaphysical belief, psychological analysis shows that knowledge is impossible;* but the nature of that belief which is necessary to all cognition, will be better understood in the light of the following propositions:

(1) All intense and vivid experiences tend to evoke and confirm the belief in reality which characterizes knowledge.[1] As such belief itself grows clear and strong, the mind passes over, as it were, from states of opinion (*mere* "belief," in the more popular meaning of the word) or thinking, into states of knowledge. Whatever we sense, imagine, think, or even—within certain limits—feel, or will, intensely, in the reality of that do we

[1] On this point comp. James: The Principles of Psychology, II., p. 298 f.

tend to believe. (2) This metaphysical belief is called into consciousness as the result, particularly, of inquiry or doubt. But the denial of the real existence of any object, imagined or thought, implies knowledge and its characteristic belief as truly as affirmation does. This form of mentality might then be called a "belief *in respect of* reality," rather than a "belief *in* reality." (3) If we speak of this belief as "instinctive" (with a confessedly loose use of that word), it is with the intention to note the following facts: (*a*) The belief appears in the development of mental life unaccompanied by any intelligent recognition of its own existence or of the end it serves; (*b*) it belongs to the psychical species, man, as necessarily entering into all his *knowing* functions; (*c*) it cannot be explained as the result of the development of the individual, but is rather necessary to be assumed as itself affording, in part, the explanation of the development of all knowledge. When, on the other hand, this belief is spoken of as "rational," it is meant to emphasize the peculiar connection which it sustains to all the higher development of cognition in man.

(4) Inasmuch as knowledge is the resultant of all the fundamental psychical activities of man—a matter of feeling and will as well as of intellection—it is not strange that the belief which helps to constitute knowledge should itself be regarded as a forthputting of intellect or of will, as well as an affair of feeling. And, indeed, belief in reality takes hold on all the psychical nature of man. *What* is believed to be real (and so said to be known) is, indeed, mainly a matter of intellection; but it is also a matter of both feeling and will. In respect of all the higher intellectual, æsthetical, ethical, and religious realities, feeling and choice largely determine knowledge through the dependence of this belief upon them. Yet we have spoken of this belief as feeling, not because it is a special form of affective phenomena, but because, as "conviction"—having that warmth of coloring which the word implies—it may be regarded as *a sort of universal affective accompaniment of the intellectual and voluntary aspects of all knowledge.* Finally (5), this belief in reality attaches itself in different degrees, as it were, to the different acts of knowledge and to the different objects of knowledge. All inferential knowledge involves faith in the thinking faculty itself—the indestructible self-confidence of reason. But in all immediate knowledge—whether of perception by the senses or of self-consciousness—this belief cannot be said itself to rest on grounds. It is an ultimate, unanalyzable, inexplicable fact—itself the guarantee of all such knowledge as does rest on grounds.

In maintaining that a metaphysical faith lies at the basis of all the existence and development of human knowledge, we only state a fact as scientific psychology finds it, and is obliged to leave it for philosophy—if possible—*to explain.*

§ 5. As Sully[1] has said: "Psychology requires a single term to denote all varieties of assurance from mere conjecture up to reasoned certainty, and the word belief, in English psychology at least, has come to be used in this sense." The use of this word, then, is not peculiar to our view of the nature of knowledge. But it may be asked, "Is not knowledge, when attained, exclusive of mere belief;" and, "Do we not oppose knowledge to belief, rather than recognize belief as necessary to knowledge?" Such inferences or objects of imagination as do not indubitably connect themselves with our acts of knowledge may indeed be popularly spoken of as "believed" rather than "known." But that "belief in respect of the reality" of the object —whether this object be perceived, imagined, or thought—is necessary to knowledge, all our ordinary language also makes clear. *In common speech, knowledge is characterized by an immediate conviction with respect to real beings and their relations to each other.*

The dependence of knowledge on intensity and vividness of experience, and the tendency to believe in the reality of all objects which are presented or inferred with intensity and vividness, may be illustrated variously. Thus, if men are in doubt as to what the "real" sense-qualities of objects are, their actual color, feel, taste, smell, etc., they demand that they shall be affected by these objects with unmistakable sensations of the required order. On the contrary, what they cannot recall in the form of a "life-like" memory-image, that they are in doubt about, as to whether they know it by memory as it really was. The difficulty of producing at will a life-like imaginary picture of any alleged entity, or relation, always stands in the way of our attaining a so-called *knowledge* of such being or relation. This result applies even to hypothetical entities like atoms, or luminiferous ether, and to such spatial relations of atoms as the chemistry of the atomic constitution of bodies, or the physiology of the "psychic nerve-cells," invites us to imagine. But whatever imagination brings into consciousness in a vivid and life-like way, *that* all men are inclined to believe to be real, and to affirm knowledge of, in a convincing way. Not only are illusions and hallucinations occasioned in this way; but knowledge, with its belief in respect of reality, is determined in this way.

The same truth is further illustrated by the physical and mental emphasis given to propositions that put our knowledge into the form of language. Note with what bodily warmth men "lay it down" that the truth *is* thus and so. *What I know*—especially if it is questioned by another, or if it has been gained by myself after inquiry and doubt—*that I assert with emphasis.* Gestures even are psychologically significant here; when telling what they know, men commonly bring down the fist upon the table, or stamp the foot upon the ground, or pounce upon the very words of their proposition. And upon what particular part of the proposition do they lay the emphasis expressive of that

[1] The Human Mind, I., p. 483.

belief which is an integral part of knowledge? Upon the copula ("It *is* a jaguar and not a tiger") if it be a question of affirmative or negative judgment; but upon the noun ("it's a *jaguar* and not a tiger") if it be a question of giving a correct name; and upon the adjective or the preposition, if it be a question of an actual quality or a real relation. But all such emphasis, wherever placed, shows how belief, as a sort of "feeling allied to the emotions," must accompany thought in order, by thinking, to attain knowledge. Nor can it be maintained that in science and philosophy "pure thought" is responsible for knowledge to the exclusion of all belief. The man of science and the philosopher, as truly as the politician, the artist, or the woman, has to unite the warm conviction of reality with his ratiocination in order to beget the product of knowledge. Witness the heat of assertion with which contested propositions are made, or the fine scorn shown when, in the name of "exact" knowledge, he "coolly" (?) refuses to discuss so self-evident a matter.

§ 6. Psychologists have too often confused inquiry as to the nature of that belief which is necessary to knowledge, with inquiry as to its general dependence upon the varying kinds and intensities of the three fundamental forms of psychoses. Such belief has its intellectual conditions and its voluntary conditions; it is also undoubtedly greatly influenced by various feelings, as, for example, by our fears, and hopes, our expectations, interests, desires, and prejudices. But it by no means follows that the belief itself *is* a "compound of three factors—intellectual representation, feeling, and active impulse."[1] "I *feel* perfectly sure" is, in popular speech, strictly equivalent to the declaration, "I *know*," whenever the alleged knowledge can be thought of as called in question or subjected to doubt. Hume, Bagehot, and—in a somewhat vacillating way—James, and others, have assigned this belief to the life of feeling. "In its inner nature," says the last of these three, "belief, or the sense of reality, is a sort of feeling more allied to the emotions than to anything else." Mr. Bagehot, indeed, speaks of the "emotion of conviction" as equivalent to this belief. Other writers call our attention to the dependence of such belief on imagination. The belief is conditioned upon imagination, but it is not an act of imagination. The pain which Balzac, when a boy, could produce in any part of his own body through which he pictured himself as thrusting his penknife, was no less real because it owed its origin to an act of imagination. Belief in respect of reality is favored by intense and life-like imagination, and such belief is necessary to knowledge; but the belief, as such, is rather of the nature of feeling than of either thought or imagination.

The principal Kinds of Knowledge may be distinguished by adopting either one of two points of view: we may consider either (1) the processes of consciousness, through which knowledge is chiefly attained; or (2) the classes of objects known in and by the processes. Thus knowledge is either Immediate or Inferential; or else it is the knowledge of Things or the knowledge of Self. The former division lays emphasis on the ques-

[1] So Sully: The Human Mind, I., p. 495.

tion, How do I know? the latter, on the question, What do I know? But on subdividing immediate knowledge into Perception and Self-consciousness, both principles of division are recognized; for perception may be understood as the immediate knowledge of things, and self-consciousness is the immediate knowledge of self.

Immediate knowledge and inferential knowledge differ, as forms of knowledge, in an important way; because they lay emphasis upon the predominance of different activities of the mind. In the former that "envisagement," or awareness of the object face to face, as it were, which developed consciousness attains, is the characteristic of knowledge. In the latter it is the faculty of thought, or especially the logical drawing of conclusions, which brings about the state of conviction when knowledge is attained. But there is no perception so immediate that the act is not a process in time; or so much of a complete "envisagement" that judgment does not enter into it. On the other hand, the most complicated and lengthy processes of reasoning cannot result in *knowledge*, however logically conducted they may be, unless they start from immediate perception and self-consciousness, and support themselves at every step on such immediacy, with the conviction of reality obtaining all the way through. In immediate knowledge, the object is present as some Thing known, or as some state of the Self known; in inferential knowledge the existence of some object is concluded (known by the process of logical thinking) as having its "ground" or "reason" in other inferential knowledge; or—finally—in immediate knowledge. The sphere of immediate knowledge is thus covered by what we envisage in sense-perception or in self-consciousness; the sphere of inferential knowledge includes all that, concerning the being and relations of things and minds, which we can connect, under the principle of sufficient reason, with any immediate knowledge.

§ 7. The more special psychology of these two kinds of knowledge has already been treated at considerable length; but the relation to them both of that "belief in respect of reality" which enters into all knowledge deserves some further notice at this point. Plainly, our "metaphysical" belief does not stand in precisely the same relation to inferential knowledge and to immediate knowledge. With respect to the beings and relations which I know inferentially, an appeal to reasons is always considered justifiable. For example, I am always liable to be asked: *How* do you *know* that the medulla oblongata is the reflex and automatic center connected with the vaso-motor and respiratory functions; or that the region about the fissure of Rolando is the sensory-motor cerebral region for the control of the

upper and lower limbs? Or again: *How* do you *know* that it rained last night; or that it is colder to-day than it was a year ago; or that an attempt has been made to assassinate the Czar of Russia? In all such cases a question recognizes the fundamental fact that it is necessary to the very life of the intellect for conviction to justify itself by giving the grounds on which it rests. But the grounds on which the conviction rests are reasonable only if they are such grounds as justify the conclusion when logically considered. Otherwise one must say: I feel pretty sure, or very sure, but I do not positively know; and this is equivalent to saying, I cannot validate the concluding proposition as inferential knowledge. We do, indeed, argue such questions as this: "Is yonder form that of a child or a man?" or, "Was it our friend *X*, or the newly arrived stranger *Y*, who passed us on the street just now?"

Suppose, however, that in the course of any argument the facts of immediate knowledge are found to be the same in the minds of both parties to the dispute, while one holds that these facts constitute "a sufficient reason" for a certain conclusion, but the other draws an opposite conclusion. Then the meaning of the question, *How* do you *know?* is changed. Each party to the dispute begins to suspect the other's "conviction" of being "irrational," of reposing on no "sufficient grounds;" or of being feigned, or prejudiced, in fact. Claims may, indeed, be set up to *know* things, which are only inferentially known in the ordinary working of human minds, by some mysterious so-called "tact," "intuition," or "insight." Such claims are even now being extended over the vague and doubtful realm of clairvoyance, telepathy, etc. On the other hand, we meet to-day everywhere with the psychologically interesting phenomenon of distrust of all alleged knowledge, accompanied by the greatest confidence in the power of the intellect to criticise negatively its own operations. Thus men abound who, like the Count Kostia whom Cherbuliez depicts, "expend much logic to demonstrate that there is no such thing as logic, either in nature or in man"—sceptics that "pass their lives reasoning against reason."

The psychological lesson from all this is to the effect that so-called knowledge from inference is a matter of infinitely varied degrees and shades; and that it is subjectively dependent upon the amount and character of the belief in reality which enters into it. *Not by bare ratiocination but by the manifold life of knowledge do we reach into and progressively conquer the actual world of beings and events.* Let us suppose, however, that inquiry regarding the reality of some object of immediate sense-perception has been reduced to its ultimate terms ("ultimate," that is, psychologically considered). For example, let the question whether yonder form is that of a man or a child, be narrowed down to this: *How* do I *know* that the object which I, distinctly and persistently, now *perceive* thus and so, *is really as* I perceive it? Doubtless, in any such case of dispute we should, if possible, appeal to the bystanders. If common consent were on our side, we should feel the conviction that our knowledge was immediate and indubitable, in a degree confirmed. This appeal itself would, however, at most establish by inference what appeared to us to be more certain than anything that inference could establish. But here, what has been shown to be true with respect to the amount of judgment, and even of condensed syllogistic reasoning, which

enters into our complex developed acts of perception, must be recalled. In the last resort, however, we may describe our experience in some such terms as follow: "At any rate, so I here and now see, or feel, this object to be. However all the rest of the world may know it, and whether they know it at all or not, I now certainly know it to be, for me, thus and so." We should then seem to ourselves to have reached an ultimately certain knowledge. In general, *the belief in the reality of the object "immediately" known is an irresistible conviction, resting on no grounds outside of itself; it is itself a primary and unanalyzable datum belonging to the very nature of all immediate knowledge.*[1]

As respects its objects, Knowledge is either *of* Things or *of* Self. This distinction between "Self" and "Things" becomes, only as a result of the development of cognition, so clear and so fundamental that it appears to ordinary thinking to be original and to belong to the very conditions of experience, as well as to the nature of reality. The sane adult never confuses himself with things; the very question, how he came to make and maintain so consistently this distinction, seems to him to savor of irrationality. For how could it possibly be that the distinction should *not* be made; since it lies at the very base of all cognition of reality? On the contrary—as we must once more remind ourselves—all objects of knowledge, psychologically considered, are alike to be regarded as states of consciousness; all states of consciousness are time-processes in the onflowing stream of consciousness. This is as true of things perceived by the senses as it is of the self-known in self-consciousness. Moreover, all processes of knowledge imply, because they involve, the development of mental life; and the study of perception by the senses, as well as the study of self-consciousness, shows that the clear distinction between things and self is something which itself results from this very course of development.

It is incumbent, then, upon psychological science to raise the question as to how this progressive "bi-partition" (we might say "diremption," if the word were not obsolete and did not suggest a violent process) of psychoses has come about. In other words, why are some of our cognitions assigned to the one class of beings, called Things (or—negatively speaking—*non-*

[1] Little more can legitimately be said on this point unless we avowedly enter upon the philosophy of cognition. It should be noticed, however, that this conviction belongs as truly to the primary act of knowledge when its object is some thing, as when it is myself in some state. Professor James has therefore stated (though well stated) *only half of the truth* when he says (II., p. 297), "our own reality, that sense of our own life which we at every moment possess, is the ultimate of ultimates for our belief." So Lipps, in the sentence quoted by James: "*Mein Jetzt und Hier ist der letzte Angelpunkt für alle Wirklichkeit, also alle Erkenntniss.*" *It is rather the reality of the object, as necessarily implicated in the very process of cognition, whether that object be some Thing or Myself, that serves as the point to which the conviction irresistibly attaches itself.* As the theory of knowledge would say: *Being—concrete and here and now given—and Knowledge are correlates.*

egos, *not*-self) and others of them assigned to our own being, to the so-called Self? As to the validity in reality of this distinction, psychology as a descriptive science has nothing whatever to say.[1] Nor can science do otherwise than accept it as an ultimate and mysterious fact. The words, "consciousness, *as such*," imply the distinction. The same distinction is implied in all special discussions as to the facts and laws of the life of sensation and motion.

Psychology is bound, then, to note the distinction between Things and Self, as objects of cognition, fundamentally opposed as they are by the development of mental life itself. But it is only bound to tell, as far as possible, the reasons or grounds of the distinction so far as they lie in differences of psychical phenomena. And, indeed, this has already been partly done, particularly with reference to the knowledge of things. For such knowledge is gained by perception with the senses; and we have already discussed the elementary psychoses, and laws of the combination of psychoses, which characterize the rise and growth of perceptive knowledge. It remains, then, chiefly, to trace somewhat more in detail the development of the knowledge of self.

§ 8. Both the content of consciousness and the general tone of consciousness are "objective," or externally directed and focused, as it were, in our knowledge of any thing. The meaning and bearing of such a statement can be understood only by considering it in the light of all that has thus far been said respecting those mental processes which enter into our so-called "external" knowledge. For example, what are the distinguishing characteristics of my mental states when I am examining a flower, watching a spectacle, or looking through a microscope; or, again, when I am feeling a surface, lifting a weight, or pushing a lawn-mower? As respects content of consciousness, those series of sensations—notably of the eye, and of touch, including muscular and joint sensations—that have a predominating objectivity are determining the flow of the stream of consciousness; attention is being concentrated on the localized and projected sensation-complexes; the images revived and fused with the sensations are chiefly representative of past sensations; and the condensed psychological judgments that take place have reference to changes, experienced or expected, in the sensation-complexes. Moreover, the more conceptual elements of the mental state—such as the naming and classifying of, and concluding about, the object—are such as connect it with other similar or unlike *things*. That is to say, *it is visual and tactual sensation-complexes, with the memories, imaginings, thoughts,*

[1] Nothing can be more unscientific and unwarrantable than the assumption that this distinction of Being, between Self and Things, not only does not, but cannot, correspond to the reality; and yet this assumption is current with a large number of psychologists who are not slow to arrogate the title "scientific" to themselves alone. Indeed, it has recently been proclaimed as a tenet demonstrated by psycho-physics so that they—forsooth!—who do not accept it, off-hand as it were, are to be denied all standing among "*scientific*" psychologists. As to the philosophical tenure of this rash metaphysics, this modern Spinozism, we have elsewhere had something to say, and hope to have much to add in other connections.

and reasonings, referring to sensation-experiences, which characterize the content of so-called external cognition. Moreover, the feeling-tone, and conative activity of this state of knowing a thing differs markedly from the affective and volitional aspects of distinctively self-conscious states. The affective accompaniments are not so much interesting in themselves, because of their pleasurable or painful tone, as they are feelings of sensations—feelings which assist in discriminating more effectively the objects of the sense-perceptive activity. Conative consciousness is also very different when the object of cognition is some thing rather than some state of the self. This is true, not simply with respect to the direction of attention upon the different parts and changing phases of the perceived object; it is also true with respect to the entire condition of dependence upon volition which is characteristic of the object. I cannot *will* changes in things, their relations and their qualities, as I can will changes in my own states.

The knowledge which is of self differs from the knowledge which sense-perception brings, both as respects content of consciousness and general tone of consciousness. *This knowledge has its content not chiefly in sensations at all, but in mental images, thoughts, feelings, or volitions.* The sensuous elements of consciousness, especially those of the most definitely localized and clearly projected sort, are relatively suppressed. In predominating states of self-consciousness, the sensations are of the vague, unlocalized order, which are attributable to myself as a sentient organism, rather than to any objective thing. But especially is the attention directed to feelings which are interesting to me, as *my* feelings, because of their tone of either pleasure or pain. In this way, by the influence of feeling over attention, one often passes back and forth between the objective and the subjective aspects of the same experience. For example, when one is in a bath one feels the temperature of the water as the quality of an external thing; but, if it is greatly too cold or too hot, one becomes aware of one's self as suffering with the pain of heat or cold. It is largely because of their ordinarily toneless character as feelings that our visual sensation-complexes are customarily known as qualities of external things.

§ 9. In spite of the fact that *all* knowledge is based, as it were, upon the "bi-partition" of our cognitive experiences, there are forms of experience which it is difficult to classify definitely with either of these two great classes. This is true in a singular fashion with regard to what is sometimes called "tact." The knowledge (?) reached in this way largely resembles a kind of objectified self-knowledge. Tact is knowledge of things by an eccentric projection of self-feeling. It has already been shown that a feeling of qualitative distinctions lies at the basis of all our knowledge of spatial properties and spatial relations of things. But "feeling of qualitative distinctions" is chiefly subjective, and "knowledge of spatial properties and spatial relations" is objective. What is true of the earlier developments of knowledge, is also true where developed knowledge has become, by familiarity, so much a matter of intuition as to lose its ratiocinative character. Pre-eminently true is this of all that knowledge which art displays. Not only does the knower find it difficult to give reasons why; but, in the process of knowing, he almost seems to lose the distinction between himself and the thing known. Here, as we shall subsequently see, "tact" and "art,"

on the one hand, and "instinct," on the other hand, seem to come together. For example, let it be supposed that one is learning how to open a certain combination-lock. One is told the combination is "three and a quarter to the right, then six and a half to the left, then one and three-quarters to the right, etc." One now knows *how* to open the lock; but probably one cannot *open* it—for the knowledge is too markedly objective—although one gives great attention to the lock, to the counting, etc. But when the knowledge has become a matter of self-feeling, one need pay little attention to the objective thing; one may reach the end of knowledge by letting this suggested course of self-feeling run itself through. Again, we may ask, who best knows how to handle the graving tool, or to play the violin; he who clearly distinguishes himself from the thing which he voluntarily moves, and accompanies every movement with discriminating perception and conscious thinking; or he who is so independent of such distinctions and processes of thinking, that he can become absorbed in his own life of feeling and idea, and can let this life express itself in a sort of unconscious union of self and sensuous object? The answer to such questions plainly depends upon the conception which we form of the nature of knowledge.

But such questions as the foregoing emphasize the following important psychological truths: (1) *The element of feeling may increasingly preponderate in any process of so-called knowledge, as familiarity and habit tend to blur the outlines of intellectual apprehension of the object of knowledge.* The character of the knowledge thus becomes more subjective. (2) *As the element of feeling becomes relatively greater in any act of knowledge, the distinction between the two great classes of objects*—things and self—*is submerged, as it were.* The "cunning" man, the "skilful" man, the "knowing" man (in this narrower meaning of the word knowledge) is he who knows how, as a matter of self-feeling, rather than he who distinguishes what, and why, he knows, and so classifies the object of knowledge.

§ 10. The knowledge of things, then—we repeat from another point of view—both implies and results from the complex development of all the so-called mental faculties. As *immediate* knowledge it rests upon a predominating sensuous basis; but as *knowledge* it is not merely sensuous. For all knowledge, whether of things, or of self, implies memory, imagination, and thought, the elaboration of the more purely presentative material. The knowledge of things involves also the development of feeling and conation; and it is in part because the affective and conative elements connected with externally originated sensations have the characteristics which they possess, that the "bi-partition" of all objects takes place as it does, and knowledge of *Things* results. But, finally, this knowledge, like all *knowledge*—as distinguished from the mere having of objects in consciousness—implies also belief in reality. And "belief in reality" is, for psychological analysis, an unanalyzable, inexplicable datum of that form of developed mental activity which we call "knowledge."

The Development of the Knowledge of Self does not involve the possession or the employment of mental faculties different from those which have already been described. On the other

hand, all these so-called faculties are exercised in the growth of this kind of knowledge as well as in the growth of the knowledge of things. From this general statement respecting the true psychological doctrine of self-knowledge, several important corollaries follow: (1) In the earlier stages of mental life no psychoses can be discovered which are worthy to be called a knowing of self. If we adhere to the distinction already insisted upon (Chap. III.) between consciousness and developed self-consciousness, we cannot properly ascribe self-consciousness, or the "immediate awareness" and reference of any state to me as *my* state, to the infant mind. (2) Certain classes of the elementary processes of mental life possess characteristics which focus attention upon them, and which stimulate discriminating consciousness to set them apart, as it were, from other processes in the stream of consciousness. Such characteristics are furnished by the tones of feeling and the amounts of conative activity which render psychoses subjectively interesting. On this basis some states of consciousness, regarded merely as states, are fitted to be ascribed to the so-called "Self"—a conception of which is formed on the basis of experience chiefly, at first, with this very kind of conscious states. (3) Development of the knowledge of Self, like that of the knowledge of things, follows a certain general order, which may be said to be the order of nature and essentially the same for all men. At the same time different men, and even different races, differ quite as markedly in their conceptions of self as in their conceptions of things. Nor is this difference confined to conceptual and inferential knowledge of the Ego alone. What Lotze has vaguely called "self-feeling" is by no means the same, either in its complex qualifications or in its intensity, with all individuals or all races. Moreover, inasmuch as knowledge of Self is still *knowledge*—and so is subject to all the conditions and laws which make cognition in general possible—the self-knowledge of some is more largely a matter of intellection; of others more largely a matter of feeling; of others, more largely a conception suffused with predominating motor consciousness. And, indeed, if this were not so, the knowledge of self would not be knowledge at all; for it would not correspond to the reality. In some men's actual lives the emphasis is habitually laid upon the intellectual aspect; in others, upon the emotional aspect; in still others, upon the conative aspect of consciousness.

§ 11. On referring to the previous discussion of *consciousness*, we find (p. 34 f.) that not only must the word be employed as equivalent to psychosis in general, but also as "synonymous with psychical state, regarded as discrim-

inated, however faintly, in respect of content, and related, however imperfectly, to the stream of mental life." When, then, the development of consciousness takes the form of *self-consciousness*, and the object of knowledge is the so-called *Ego*, or *Self*, the process and product of mental life is no whit more mysterious than when that object is some so-called external thing. In other words, self-consciousness is not, properly speaking, a special faculty. It is rather, as all knowledge is, the result of a complex and harmonious development of faculty. Moreover, to speak of man as superior to the other animals in the possession of self-consciousness is only the partial truth. Man's knowledge of things is just as truly superior to the knowledge of things by the lower animals as is his knowledge of self. The superiority of all his knowledge depends upon the superiority of his entire bodily and mental constitution and development. Indeed, we probably ought not to say that the lower animals have any "*knowledge*" at all resembling human knowledge.

Certain objections to this view involve the "psychologist's fallacy" in a form similar to that in which it has frequently met us before. Because I cannot deliberately make any state of consciousness an object of knowledge without exercising developed *self*-consciousness, therefore it is necessarily so with all consciousness, with the infant—about so, in brief, the objection runs. As well might one say that because I cannot open my eyes upon a landscape, and deliberately make it an object of knowledge, without becoming immediately aware of trees, houses, men, etc., therefore it is necessarily so with all consciousness, and with the infant. And to this fallacy something is doubtless contributed by that confusion of consciousness with self-consciousness, and of discriminating consciousness with self-knowledge, which has already been pointed out.

§ 12. It has been shown, as a matter of descriptive history, why some states of consciousness get regarded as *my* states, and others get regarded as the *qualities* of things. The principal reasons for this process of intellectual bipartition have been found to lie in the character of the affective and conative elements which enter into the different states. For example, let the infant that has been following a moderately bright light with his eyes be suddenly plunged into an overheated bath; or when he is gently moving his arms in mid-air, or over the bedclothes, let him be firmly and somewhat painfully gripped and held. Thus a predominatingly objective aspect of consciousness, an aspect that favors attention to external objects and the cognition of things, is changed into a predominatingly subjective aspect, an aspect that favors attention to the state of consciousness, as such, and to the cognition of self. Of course, we should not truly represent this latter state if we thought of the infant as pronouncing this judgment: "I am fearfully hot," or, "This state of painful sensation, *quoad* painful, is that of my ego." Only as intelligence develops can such activity of self-consciousness emerge. The moment, however, that these forms of painful or pleasurable bodily feeling (usually connected with conative consciousness as called out in the way of attraction or repulsion and resulting feelings of self-activity and of effort) are called "*self*-feeling," it is implied that a certain development of perceptive knowledge has already taken place. Previous to the repeated activity of discriminating consciousness, even sensations with their so-called ob-

jective reference, and feelings as subjective, cannot be regarded as divisible into two classes of objects.

The truth is therefore important, though only partial, which Lotze states in the following language:[1] "The crushed worm writhing in pain undoubtedly distinguishes its own suffering from the rest of the world, though it can understand neither its own ego nor the nature of the external world. But the consummate intelligence of an angel, did it lack feeling, . . . would never learn why it should attach any greater value to the distinction between itself and the rest of the world than to the numerous differences between things in general that presented themselves to its notice. Thus self-consciousness is to us but as the interpretation of a sense of self," etc. These statements forcefully emphasize the dependence upon feeling of the very origin and development of self-consciousness. But when *mere* pain is represented as sufficient for distinguishing the suffering self from the rest of the world, all feeling is reduced to pleasure-pain and the office of intellect in the beginning, as well as in the growth, of self-consciousness is depreciated, the view becomes psychologically indefensible. The "writhing worm" has no germ of self-consciousness simply because it is suffering pain. The intelligent angel may not need the stimulus of pleasure-pains "to attach value" to the distinction between self and things; and besides, "making the distinction" is one thing, and "attaching value" to it is quite another thing. Nor does it appear why the latter is, from the point of view of psychology, necessary to self-consciousness.

The Stages of Self-consciousness follow, in general, certain broadly marked lines. Of these stages the consummation of the first is reached when the sentient body is distinguished from other bodies with which it stands in changing relations, and which are not themselves immediately known as sentient. The primary intellectual activity involved in this stage consists in discriminating between certain perceived objects that are not felt as pleasurable or painful, and a certain one object that is not only externally perceived, in changing relations to other objects, but is also painfully or pleasurably felt. It is plain, then, that the knowledge of things and the knowledge of self are, in the earlier stages of knowledge, psychologically considered, interdependent. Hence the earliest known "myself" is *my body*, as sentient and under voluntary control—parted off from and contrasted with other bodies which are not sentient or under voluntary control. In other words, discriminating consciousness constructs the first *Ego* as identical with the entire living body—its felt pleasures and pains, and its voluntary movements especially as connected with the satisfaction of desire, the withdrawal of it from objects that give pain, or the forcing of it into contact with

[1] Microcosmus, I., p. 260.

resisting things, etc.; but it excludes from this *Ego* (as *non-Ego*) everything which does not feel with it, and follow its movableness, and manifest itself, as it were, as organically connected with it.[1]

The individual acts of discrimination between the bodily self and the other body, that is not-self, now themselves become the objects of memory, imagination, and generalization. Thus a conception of *the* Self, that is *my*self, is framed by processes of thinking, and to it a name—the name that distinguishes me from other bodies—is given. In such a process of determining the earliest conception of the Self, with its name, the intercourse of the individual with others of his race is peculiarly important. The child does not name himself; he is given a name, and thus more perfectly defined, as an object, to himself, in a manner corresponding to that of all other things by their names. As related to, and yet contrasted with, other selves—that is, bodies that are like his own to external perception but are not interiorly felt, as it were—the early conceptions of self become further developed. But at this stage, and even far earlier, another modified conception of the Ego shows signs of being in process of formation.

§ 13. It is not, of course, solely upon the marked and abrupt changes of states from general objective to general subjective tone of consciousness that the earliest conception of Self as sentient and movable body is based. In this work of "bipartition" the total *mélange* of bodily feelings—or sensations that are ill localized, confused, and mixed—takes an important part (comp. p. 334 f.). These form a sort of background or platform of consciousness on which the particular objects of sense-presentation define themselves. Nor is it in the earlier stages alone of the development of self-knowledge that the somewhat vague conception of ourselves as a remembered and familiar complex of bodily feelings is prominent. With the child who has attained any vivid notion of his self-hood, it is the feeling, moving body that represents "the self;" and his most abstract conception of his own being does not get far beyond vague generalizations, warm with emotion, upon the basis of bodily experiences. If this earliest form of representation of the Ego could speak, and could use the abstract language of philosophy, it would announce itself thus: "*What is here and now, that am I.*"[2] In this regard the child would agree with the philosopher whenever the latter tries to realize his highest conception of the self. But with the child, "What-is-here-and-now"—"that-which-am-I"—is chiefly what it can put its hand upon, of its own body; or what it feels within its own thoracic or abdominal cavities. The author once pressed a bright little girl of five years old to tell him what she meant by the "I" that "loved papa;" in the last analysis the solution of the puzzle was announced in the following sentence: "Oh,

[1] Comp. George: Lehrbuch d. Psychologie, p. 229 f.
[2] Comp. Horwicz: Psychologische Analysen, II., p. 144.

now I know; it is my arms, because I hug him with them; and my lips, because I kiss him with them." But do we not find the Apostle shrinking back from the vague and shadowy conception of an "*unclothed*" (or disembodied) *Ego?* Indeed the literature of many peoples—as, for example, of the ancient Hebrews—raises the question whether they had, in general, reached the conception of a soul as separable from the sentient bodily organism.

In this discussion certain cases of mental aberration and so-called double consciousness are of no little significance. The beginnings of similar abnormal conditions are laid in the experience of all of us whenever we are called upon to say: "I feel queer to-day;" or, "I do not feel a bit like myself to-day," etc. Here, plainly, the Self that "feels queer," or "feels unlike" the remembered self, is the sentient bodily organism; and it is implied that a certain standard of bodily feelings, derived by memory and thought from past experience, is to be recognized as constituting the "normal self." The inmate of the mad-house who believes himself to have been "changed," and to have become another than his former self, often bases this insane belief largely upon marked changes in the dominating mixture of bodily feelings. Or if such changes are distinguishable only in certain parts of the body, *he* may be, to his own judgment, the same self, but *his head* has been changed for that of some animal; his abdomen has been converted into glass, or some like change in some other bodily member has taken place. Few intellects, if any, could bear the strain of a marked and continued aberration of those bodily feelings most intimately connected with the self; judgment is almost sure, sooner or later, to follow their guidance, and—as we so significantly say—"the mind gives way." Psychology could easily arrange a continuous series of cases from those slight and easily corrected hallucinations of self which all experience, through the temporary but involuntary hallucinations of sleep, to the most persistent and extreme insane disturbances of self-consciousness. In all such cases, however, it should not be forgotten that *there is a very great difference between a certain metamorphosis of personality and a complete perversion or suppression of so-called natural self-consciousness.* The former is common enough; the latter involves the loss of all *mind*, properly so called. For, as Richet has said: "In experiments in hypnotic suggestion we can abolish and metamorphose the personality of the subject without thereby suppressing his *Ego;* and this proves that the two things are distinct." In fact, all activity of imagination, in constructing experience for ourselves or in acting the part of others, accomplishes this metamorphosis to a greater or less extent. But, as says another author:[1] "The formation of an *Ego*, as the center and subject of all psychic phenomena, is not a conventional affair; it is a natural phenomenon which is realized in the case of all men."

The Conception of Self develops further in two directions which are, to a certain extent, mutually helpful and interdependent, and yet are also, in certain other respects, partially independent and even opposed. One of these is an increasing complexity

[1] Binet, Psychologie du Raisonnement, p. 169.

of the conception considered as involving a variety of external and relatively adventitious particulars; the other is an increasing abstractness of the conception, considered as a mere, or "pure," *Subject* of all the states of consciousness. With the multitude of men the knowledge of self is chiefly a matter of the descriptive history of their present and past environment, as it were, regarded as somehow absorbed into, or helping to constitute, the familiar and recognizable picture answering to the words—"I myself." Hence, in part, the origin of that psychologically interesting sense of importance which becomes attached to one's name, ancestry, date and place of birth, residence and relatives, business and recreations, etc.—all of which fill in the otherwise bare conception of *who*, and *what manner* of one, *I am*. Let but these things be dropped out of memory beyond the possibility of recall (as happens in cases of general paralysis, for example, or of extreme dotage), and self-consciousness relapses into an infantile, an almost animal, stage. It is, therefore, difficult or impossible to separate, in the conception of Self, that which we have had experience of as our environment from that which we have become in the midst, and so largely through the influence of, this same environment.

In connection with this more external development of self-knowledge the conception of Self as the permanent Subject of psychical States is in process of formation. The whole course of definitively *intellectual* growth renders the bodily feelings less pre-eminent, not to say overpowering, as an essential condition of such growth. The processes of ideation, of thought, and of the more complex and refined forms of feeling, do not admit of definite localization, or even of that obscure attribution to the bodily self which the intra-organic sensibilities require. Yet all these so-called *intellectual* activities not only have their objective reference but also their aspect of feeling; they are *felt* thoughts, etc. On the other hand, it belongs to the very nature of knowledge, as a development attained by intellectual life, to involve the belief in reality. A "Thing" as known is not a mere bundle of sensations, images, and inferences; it is a being to which attributes are ascribed. Every one's primary bodily self therefore becomes self-known as such a "Thing-being," the subject of passive and active experiences of a peculiar kind. But consciously discriminated processes of ideation, thought, and non-sensuous feelings, can no more float mid-air, as mere objective pictures, than can the coarser and more sensuous bodily self-feelings. It is natural and inevitable, then, that the intellect should form the conception of a Self, which is a real being, a

subject also of all such non-bodily states. This is rendered possible by the same kind of abstraction, freeing of ideas, comparison, thinking, and naming, which renders possible the knowledge of things. Such consciousness, in the form of a conception of being a "mind," or "soul"—a real subject of psychical processes—is at first vague and fitful; nor does it ever imply any special faculty for its attainment. It is, however, a necessary development, to some extent, of all human intellectual life.

§ 14. From the very first the more interior sense-consciousness of the bodily self is accompanied, and supported or corrected, by external perception, memory, and thought, with reference to the character and history of such self. The child forms a picture by perception of himself, as the eye and the hand explore one member after another; and as the whole visible body appears in a mirror, or is known by synthesis of all the appropriate skin- and muscle-sensations. Marked and abrupt changes in this picture by external perception produce a shock to, and sometimes an important modification of, the consciousness of self. Even adults say, after a severe illness: "Why, how changed I am," with more or less of a feeling of disturbance to their conception of personality. Those proud of their personal beauty, when it is lost, often show a profoundly modified self-consciousness. But even more influential, perhaps, is the physical and social environment. Those who travel for the first time in Oriental countries are often somewhat more than merely amazed at the external differences of custom and scenery. They seem to need to pinch themselves to make sure they are not dreaming; they recount their own names and histories in order to "realize" who they are. Indeed, ignorant and easily unbalanced persons may suffer a nearly total change in their prevalent mode of self-consciousness by being suddenly transferred to totally changed surroundings. Thus Delbœuf [1] tells the story of the cobbler of Liège, who, having been captured by the monks of a monastery near which he had lain down in a drunken fit, awoke to find himself bathed, shaved, afflicted with tonsure, clothed in monk's garb, couched in a cell, and surrounded by "the brethren," who presented their compliments and asked eagerly as to his health. After struggling with the confusion thus produced in his conception of himself, the poor wretch finally said: "Go to the foot of the bridge and see if Gilles the cobbler is in his shop; if he is not, I am he; but if he is, may the devil get me if I know who I am." This same psychological truth Shakespeare illustrates in his "Taming of the Shrew," by the confusion of self-knowledge which he represents as wrought, through total change of circumstance, in Christopher Sly.

An important part of that which is originally external, but becomes an almost essential part of the Self—especially in the case of minds of a low order of intellectual development—is the *name*. For "the name is not worn as a dress," said Göthe, "but grows on to us layer upon layer, like our skin." Hence men of savage tribes fear to have their names tampered with, as they also fear to have their pictures taken; for somewhat important belonging to the *ego* resides in the name. Volkmann [2] has remarked that

[1] Le Sommeil et les Rêves, p. 86 f.

[2] Lehrbuch d. Psychologie, II., p. 171 f.

certain savage tribes change the name of a sick child; and that calling an intelligent animal persistently by one name would seem to tend toward an obscure development of self-consciousness. Literature and daily observations are full of illustrations of the effects also upon self-consciousness of changes in physical and social surroundings. Indeed, how could it be otherwise; for what I know myself to be is largely summed up in my knowledge of my life-history, and this is no real affair except as it has had a continuously traceable environment. When the man proud of his ancestry first learns that he is illegitimate, or the rich man fails in business and moves into a mean house and takes up a wholly different employment, or the trusted bank-officer finds himself in the felon's cell, or the father recently surrounded by a family is bereft and lonely, the changes induced in the consciousness and estimate of self are apt to be most profound. On the other hand, it is just those whose consciousness and estimate of self have been most directed toward the reality and worth of the higher mental life who are least affected by sudden and great changes in external surroundings.

§ 15. The act of so constituting the total process of consciousness as that this process shall be both considered as an object of consciousness (a *state*) and also referred to the subject of consciousness as its action or suffering (*my* state), offers a perpetual puzzle to psychology. The facts must not be denied or overlooked, whether the puzzle itself can be solved or not. When any act of so-called self-consciousness is expressed by saying, "I am immediately aware (*I know*) that I am perceiving, remembering, thinking, or purposing," it is not meant simply to affirm the existence of a state of perceiving, etc.; it is meant also to affirm the attribution of this state (or rather process of consciousness) to a subject, whose it is. *Developed self-consciousness further implies the conviction that the subject and the object are related as a being is related to one of its many states.* Psychology even of the most barely descriptive sort, and however careful to avoid metaphysics or theory of knowledge (not to say so-called "psychology without a soul") cannot overlook the significance of this fact of self-consciousness, as such. We have, however, already sufficiently located the points of inexplicable mystery; they all belong to the nature of knowledge and of its development; the mystery of self-consciousness is only the mystery of knowledge, which is essentially the same whether its object be so-called "things" or the so-called "self."

The more interior development of self-consciousness scarcely needs to be traced with great detail. The processes of ideation, as differenced by discriminating consciousness, are themselves made objects of abstraction and generalization, and given a name; they thus serve as the basis for the conception of "that-which-ideates"—of "myself as having the ideas." This involves the focusing of attention upon these processes, the formation of an abstract idea of what they are, the distinguishing of each particular recurrent process as the same in character but differing as to place in the time-series. This also implies that belief which makes it impossible for us to regard our psychoses as objects of knowledge uncorrelated with that being whose states they are. The fact, however, that—as in cases of hallucination and dream-life—certain processes of ideation may be assigned, not to self as my states, but to things as their states, and the fact that ideation enters

into all sense-perception, prove that the question whether any particular object of knowledge shall appear, as *of* things, or *of* self, is one which the mind must learn to decide. For it is, so to speak, the way in which the particular presentations in the stream of consciousness fuse with the total character of the stream that determines whether they shall be known as external objects or as states of the so-called self.

It is, however, as a thinking and willing being that I know myself as most clearly and unmistakably differenced from all external things. My images of things, though mental, are effective in consciousness for determining attention externally, according as they are concretely life-like or not. But the paler, more abstract, more truly conceptual, the content of consciousness becomes, the less possible is it to regard the state of consciousness as other than my own activity, the mode of my thinking self. The mind that feels itself thinking, knows itself to be, and to be active, in its thoughts. We may, indeed, objectify our thoughts, and say, with the Idealist, "There is nothing real but thought;" but we cannot attach any meaning to such a declaration without understanding it also to affirm the reality of the thinker whose are the thoughts. And, while it is true that acts of conation which result in intense bodily reactions tend to emphasize the bodily self, it is also true that such complex deeds of will as choice, planning, and conducting trains of thought, cannot be ascribed to any other subject than this most interior Self. It is as self-active and as aware of this activity—in the meaning of these words already sufficiently explained—that this most interior Self is most immediately known. On the basis of these experiences there is formed a conception of "Myself" as controlling, mastering, and understanding both myself and external things.

Further, the influence of conscience, and of all the æsthetical and religious sentiments is important in developing the consciousness of self. The child knows itself in a new and intellectually quickening way when the sense of responsibility is once thoroughly aroused. Indeed, it is largely because man is trained to feel that consequences depend upon, not only what he does but also upon what he even thinks and feels, that his knowledge of Self far surpasses the bounds within which the self-consciousness of the animals is limited. Nay, more, it is this ethical self-consciousness which largely constitutes his claim to be the only truly *self*-conscious of the animals. To be ashamed of one's self, grieved at one's self, stirred by the sense of one's duty, or one's improved or lost opportunity—in brief, to have the "feeling of the ought" and the feelings of moral approbation and disapprobation—is to have one's eyes opened widely to the reality and significance of being a "Self."

Finally, it is by complex synthesis of judgments, based on manifold experiences converging to one conception—the resultant of many acts of memory, imagination, reasoning, and naming—that the Knowledge of the Self as a Unitary Being is attained. The self that I thus come to know is regarded as the one subject of all the states of consciousness; whether they be states of knowledge, of feeling, or of willing, and whether they

be known presentatively, as here and now, objects of self-consciousness, or remembered or imagined as states of the past, or conjectured as possible states to be existent in future time. I thus become known to myself as both real and logical subject of all the states in the ceaselessly flowing stream of consciousness. This is the final and supreme achievement of self-knowledge. But this knowledge can never, of course, be other than itself a process of conscious mental life, attained as the result of a development. *In one and the same act the mind makes itself the object of its self-knowledge and believes in the real being of that which it creates as its own object;* and then it passes into other states of knowledge that dissolve this unique creation by turning the attention to external things.

It belongs especially to the theory of knowledge and to the philosophy of the mind to discuss the nature and validity of this knowledge of Self as one real being—the subject of all the different states, the subject of a life-history and of a course of development. Psychology can only present this knowledge as being itself the complex resultant of all those activities which enter into the development of knowledge. Such a self-consciousness, however, includes far more than what we are immediately aware of ourselves as being; it is highly abstract and theoretical, so to speak; it is conceptual, as expressive of many trains of reasoning. The foundation on which it rests is the total experience of mind with itself. The fundamental fact here is, as Dr. Ward has said,[1] a "certain objective continuum forming the background or basis to the relatively distinct presentations that are elaborated out of it."

What, we may ask, actually takes place when I try to become conscious of myself as one really existent being? I may come to such self-consciousness in one of two principal ways; but in either case I must *think;* I must by judgment relate, or ascribe, somewhat to that which I call myself. In the most nearly "immediate" acts of developed self-knowledge I find myself endeavoring to grasp together, in an act of judgment, a certain dark and confused complex of ideas and feelings, with points perhaps of more definite lucid mental representation; and meanwhile thinking the proposition that *they are mine.* But what is this "*me*," whose are the ideas and feelings that constitute the present content of consciousness? The answer to this question can be given only by another similar act of self-knowledge.

Or again the question, What am I to myself, as one real being distinguished from all other beings?—may be answered in a

[1] Article Psychology, Encyc. Brit., p. 42.

more objective and historical fashion. I may emphasize in my thinking, not only the conviction that I am *now* one feeling, thinking, willing, being, but that I *have been* one and the same, since I began to be at all. Here, of course, I rely upon memory to inform me as to what I "have been," psychically, in the past. I know myself as one and the same to myself, because I can trace in memory something like the continuity of a life-history. Such self-knowledge, it has truly been said, may be at once the richest and the poorest of all forms of conceptual knowledge—including, as it does, in its varieties, the peculiarities of race, temperament, constitution, social position, and the retreating or advancing bodily basis, differences in stages of intellectual development, and various other like considerations.

§ 16. Few subjects in psychology have been treated in more unsatisfactory fashion than the nature of self-consciousness and of the developed form of self-knowledge which results in the view that the soul is an entity separable from the body.[1] On the one hand, we are told that "the unity of the *Ego*, in both its earlier and its later condition, is no other than that of a river in which one wave follows another and mirrors its motion." The attempt has even been made to resolve the entire conception chiefly into tactual and muscular sensations obscurely localized in the region of the head, etc.! On the other hand, it may be claimed that all "self-consciousness is the recognition of one's own essence as that of a really existent and independently acting force." The psychology which underlies the current systems of so-called "natural theology" would make the self-identity, spirituality, and real unity of the soul matters of immediate and indubitable "envisagement" by every human being. How far from the truth of psychological fact, in both directions, are these two classes of extreme views, we hope our previous discussion has made sufficiently evident. There can be no doubt, on the one hand, that every human being both knows and thinks of himself as something quite different from a mere flowing stream of consciousness, or a succession of states, "some of which mirror other previous states," etc. So shabby a psychological theory needs only to be taken into the presence of any sturdy child's consciousness in order to be driven out of the field. On the other hand, not the most highly sublimated philosophic self-consciousness can find within itself all that the current theology has tried to vindicate, without argument, by its misleading appeals to self-consciousness.

[On the psychology of Belief and Knowledge, the following works may be consulted: James: The Principles of Psychology, II., xxi. Bain: The Emotions and the Will, p. 20 f., 215 f. Ward: Article Psychology, Encyc. Brit. Sully: Illusions; and The Human Mind, I., p. 483 f. Taine: De L'Intelligence, I., ii., chap. i. Lotze: Microcosmus, I., p. 340 f. Höffding: Outlines of Psychology, V. D. Hamilton: Lectures on Logic, xxvii. Volkmann: Lehrbuch d. Psychologie, II., § 105 f., and 117 f. Horwicz: Psychologische Analysen, ii., 1 (Was ist Denken?). Lipps: Grundtatsachen d. Seelenlebens, Abschnitt, iv. On Self-consciousness, besides the references at the end of Chap. III., see also the following: George: Lehrbuch d. Psychologie, p. 400 f. Fortlage: Beiträge zur Psychologie, p. 156 f. Delbœuf: Psychologie comme Science naturelle, p. 12 f. Paulhan: L'Activité mentale, p. 297 f. Rabier: Psychologie, p. 52 f. Lazarus: Das Leben d. Seele, ii., p. 41 f. Tiberghien: Science de l'Âme, Introduction. Herbart: Psychologie, I., p. 176 f.]

[1] Comp. Volkmann: Lehrbuch d. Psychologie, II., p. 168 f.

CHAPTER XXIII.

THE EMOTIONS AND PASSIONS

We turn now from the development of the predominatingly intellectual side of mental life to consider the origin and growth of faculties belonging to the affective aspect of consciousness. In general, however, the formation of the more complex forms of feeling implies all that has hitherto been discovered respecting the growth of knowledge. Indeed the dependence of the higher emotions and sentiments upon the intellectual processes of memory, imagination, and thinking, is obvious and immediate. For while it is true that the simpler and more primitive forms of feeling do not necessarily occur "in view of" any object, the same thing is not true of the more developed forms. Of them one must doubtless say—at least, as a rule—"I feel thus and so *because* I perceive, remember, imagine, or think, thus and so." But even in the case of these emotions and sentiments, any excessive increase in intensity or massiveness, so to speak, tends to extinguish the intellectual aspect of consciousness altogether. Thus the exceedingly angry or terror-stricken man, or the lover of art all absorbed in the flow of his own affective life, may almost completely cease to have "objective" consciousness. It is—as we have seen—for valid physiological and psychological reasons that the intense and full-flowing stream of conscious feeling tends to break over into the indeterminate field of the so-called "unconscious." Thus the "self is lost" through excessive indulgence in the most subjective of its own faculties.

The bewildering complexity of the feelings, and the difficulty (or even impossibility) of classifying them satisfactorily, has already been sufficiently noticed (see p. 179). It adds little or nothing of value to the science of the affective phenomena of consciousness to treat with prolixity and fidelity to details all the different emotions, passions, and sentiments. No classification here—not even the broad one we have adopted—is a matter of hard and fixed lines. *Substantially the same mental state, so far as distinctions of affective quality are concerned, may be called*

simply a feeling, or an emotion, or a passion, or a sentiment. Moreover, the subdivisions between individual forms of feeling grouped under these classes are difficult to establish in definite fashion. For example, the distinction between certain forms of agreeable feeling and æsthetical sentiment, or between certain æsthetical sentiments and allied ethical sentiments, or between sentiments which may properly be called intellectual and certain so-called "feelings of self," is scarcely a fast and unalterable distinction. But the main purpose of psychological science is, not to divide and subdivide the feelings, but to show on what conditions, and by what stages, the life of feeling develops as an integral part of man's entire mental development.

In treating of the Development of Feeling and the Formation of the Emotions and Sentiments, four things (four "variables") have chiefly to be taken into the account. These are (1) the varying intensities of the primitive forms of feeling as they are combined in the emotions and sentiments. All feeling, like all sensation (and, as we have already seen—p. 195—in partial dependence upon varying intensity of sensation), is capable of being varied in quantity. This is most obviously true of those feelings which are distinctly pleasurable or painful. There are no mental phenomena, as such, whose changes in intensity we observe with more interest and more assurance of a correct estimate than our own pleasures and pains. But feelings, even considered apart from their pleasure-pain characteristic, seem to vary in amount; for example, one is more or less surprised, expectant, fearful, etc. But (2) in connection with, and largely in dependence upon, their variation in intensity, the different forms of feeling are all more or less modified by what we may call their "bodily resonance." The explanation of this characteristic belongs to the essential doctrine of the emotions and passions; it will therefore come later on. It is enough to say now that as our feelings change in character, and especially as they rise and fall in intensity, resulting changes of a physical sort occur in almost the entire bodily organism. These physiological changes themselves react upon consciousness and further modify its feeling-content. Thus we may say with no unmeaning figure of speech, that every feeling—when it reaches a certain grade of intensity—"resounds," with its influence, through the various systems of organs (vaso-motor, respiratory, muscular, and tactual, digestive as well as cerebro-spinal) to the remotest parts of the body. But now, in turn, this very "bodily resonance" is itself, *not only* or chiefly *known* as a certain objective condition of the body, *but also felt* as a modification of the feel-

ing which produced it. And, finally, each particular form of feeling, simpler or more complex, has its own particular set of "resonances" which it produces; each form, therefore, feels in a way peculiar to itself (that is, as a natural and normal support and strengthener) the reactionary effect of these resonances.

(3) The dependence of feeling on ideation and thought is such as to cause new varieties of feeling to emerge in consciousness as certain ideas, or forms of imagination and judgment, are attained. This intimate relation between the kinds of complex affective phenomena and the course of the ideas operates in two directions. On the one hand, some emotions and sentiments seem, by their very nature, to be connected in origin with certain unique forms of ideation. Such a relation may be said to exist, for example, between the idea of the "right" and the feeling of obligation, the idea of "beauty" and all truly æsthetical sentiment, the conception of "truth" in abstract form and that passionate devotion to it which some men exhibit. On the other hand, modifications in intensity of the processes of ideation, and the new and higher combinations of these processes, react upon the feelings to such an extent as to produce differences in kind. When the intensity of any form of feeling is much increased, something like the effect which we have already noticed in the case of the sensory-motor mechanism takes place in the trains of associated ideas. Imagination and thought are modified—quickened, impeded, or disturbed—by a rise in quantity of feeling, and this modification of the intellectual processes in turn reacts upon the feeling. It may even change its character so as to make it seem a new kind. Obviously, emotions and sentiments like patriotism, enthusiasm for humanity, love for any form of scientific pursuit, are dependent for their very existence upon a complex ideational and conceptual development.

Yet again (4), increase in complexity of the elements which enter into the higher manifestations of feeling itself necessarily results in producing new kinds of feelings. By combination of the more elementary affective phenomena an almost indefinite variety of emotions and sentiments results. Here, as in all cases of truly mental synthesis, the elements lose their distinctive and recognizable characteristics in consciousness as they merge in the total stream of conscious life. Thus many so-called "conflicts of feeling," or "states of divided feeling," become something more than a rapid passage from one form of elementary emotion to another contradictory form. The feeling of the conflict, the feeling of being divided (or, as we say, "torn" with feeling, or "drawn" in two directions) is itself a new form of af-

fective phenomenon. It is also a form of emotion or sentiment that admits of various subdivisions—for example, according to the character of the feelings between which the conflict takes place (love and hatred, grief and joy, anger and sympathy, etc.). Besides such marked cases of complexity, in the form of conflict, it should be borne in mind that almost all mental states which are marked by strong feeling in the case of developed minds are *mixed* feelings. Indeed, it might almost be said that all the so-called higher sentiments and emotions are somewhat indefinitely "mixed."

§ 1. The foregoing remarks emphasize the reasons, already considered, for the difficulty of classifying satisfactorily the affective phenomena of human consciousness. What applies to the elementary and simpler forms of such phenomena applies *a fortiori* to those later developed and more complex. Indeed, certain emotions and sentiments, reckoned typical of humanity in the higher stages of civilization and culture, do not show themselves at all, or show themselves only very faintly and unsteadily, in the lower stages of civilization; or, even in the case of many individuals in the most civilized communities. For example, how comparatively few ever feel what ethics calls "general benevolence," or the unselfish "sense of justice," or the pure "love of God." So, too, multitudes never have experience of paternal or maternal affection, of the love of home, of patriotism, or of real intellectual curiosity, or of æsthetical admiration. When we speak of men "without conscience," we are not so far from a truthful description of numbers in all classes of society.

Two extreme courses in treating the psychology of the emotions and sentiments seem to us almost equally disappointing. On the one hand, a detailed descriptive history and minute classification of these phenomena—like that, for example, of Professor Bain, has little scientific interest or value. On the other hand, the attempt to deduce all forms of feeling (as Mr. Spencer does), in a semi-biological fashion, from pleasurable and painful sensation, appears far too narrow to cover the whole wide actual realm. The four above-mentioned classes of influences which chiefly effect the development of the higher forms of feeling should be constantly kept in mind. Thus we may ask four questions concerning all emotions and sentiments: (1) What particular forms of elementary feeling have been here combined? (2) With what intensity have they severally operated to produce the given quantity of emotional excitement? (3) What has been the modifying influence of the induced "bodily resonance?" And (4) what the influence from the initiating of changes in the character of the mental train? For every actual emotion or sentiment has its own characteristic complexity, intensity, bodily resonance, and ideational background, as it were. These differ greatly in every individual, and in dependence upon age, sex, temperament, disposition, and stage of culture.

§ 2. It follows from the foregoing points of view that any of the elementary forms of feeling may unite with others into a new variety of the more complex forms. Accordingly, the so-called "same" emotions and senti-

ments are really much more variable in individual cases than are those perceptions or thoughts which bear a common name. Anger, for example, in two men of different disposition and culture may be a quite different form of feeling—in one, a blinding animal emotion; in the other, a fine, strong sentiment of personal worthiness, and of the value of justice. The jealousy of the woman is in marked respects unlike that of the other sex; and one woman differs from another woman in respect of her jealousy. Thus also each of those forms of feeling which we speak of as belonging to human nature in general, under the influence of intellectual development and of growing self-control, may gradually become a more and more refined form of sentiment. For all that is highest and holiest in art, morals, and religion, has its roots in what belongs to our common human nature. And in respect of this feeling, man shows his far-reaching superiority to the lower animals not so much by the manifestation in early life of wholly new unanimal forms, as by his capacity for development under the discipline of life. This truth we shall now illustrate by several particular cases.

A. *Anger*, as an impulsive and animal form of feeling, appears early and uniformly, though with different degrees of intensity and promptness, in the life of the child. It appears as independent of, and antecedent to, any perceptions, ideas, or thoughts, which could give to it a reason or a ground. Moreover, it is a form of feeling which manifests itself most widely in nearly all degrees and kinds of animal development; and it has obvious and important relations to the maintenance of life and to the propagation of the species under the laws of all such development. The signs of this feeling may be readily provoked in the case of the average infant by firmly grasping and holding one of the movable members of his body, or by causing him any sudden, strong, and not overpoweringly painful sensation. The traces of such lower animal form of the feeling belong to most, if not to all, human beings, no matter how refined or self-controlled they become. Few do not feel anger when their bodily freedom is impinged upon in a sudden and irrational manner—when, for example, the too effusive friendly slap is received upon the shoulder, as well as when the foot is struck against a wayside stone, or the servant lets the door slam in the ear. Simple colors—like crimson, green, or orange—may excite it, through very obscure processes of association. But as intellectual development proceeds, this emotion becomes attached, habitually, as it were, to certain perceptions, imaginations, or thoughts. And so we hear men naïvely saying, "I can never see that man, without getting mad at him;" or, "I cannot tolerate the thought of it without anger." Further refined, however, this root of animal passion bears fruit in that just feeling of indignation at moral evil without which no real ethical development is possible, and which often burns most hotly in the truest and sturdiest representatives of moral culture and moral progress.

B. *Fear*, also, is an animal form of feeling that is equally universal, significant of heredity, and important in biological evolution. In the case of the child, as in the case of other animals, its earliest manifestations do not depend upon any clear ideation or thought, much less upon rational experience of the dangerous qualities of the dreaded object. Indeed, loud sensations of sound—such as thunder, for example—cause some children to cry out with a *quality* of tone which is indicative of fear rather than of bodily pain or of

anger. Sigismund tells of a little girl who showed fear of cats (congenital?) as early as the fourteenth week of life. Champneys observed a boy of about nine months old opening his eyes wide and beginning to cry, apparently with fear, at an unusual noise in a distant part of the room. At the same age Preyer observed his own child drawing back from fear, and crying, when a dog barked at the nurse who carried him on her arm.[1] Fear at being put, for the first time, in the sea, fear of persons in black, fear of masked faces, are early exhibited in many children. Intellectual development, however, in this case, as in that of anger, finally attaches the emotion to those objects which experience shows to be causative of pain or harm; or which imagination pictures in a way likely to be thus active, or thought concludes must be so. Vague and undefined fears, however, belong to all stages of life and culture; and productive and semi-æsthetical imagination is far more influential here than in the case of anger. It is not alone in the experience of children or savages that imagination largely increases the sphere filled with objects of dread. From the wretched and depressing terrors of the worst superstitions—whether they concern ghosts and hobgoblins or the beings created by the lowest forms of religious credulity—we ascend in unbroken continuity of intellectual and ethical development to that fear of the consequences of our own wrong-doing which is necessary to a high morality, or that "fear of God" which is the "beginning of wisdom." In all stages alike, the natural emotion is softened into a sentiment, or elevated to a rational feeling, by activity of imagination and thought.

C. In *Grief* and *Joy* we have other forms of feeling, of which very young children, and even animals, show marked signs, and which, nevertheless, are more dependent than anger or fear upon perception and ideation for their origin as well as development. Some semblance of a feeling of grief, however, possibly precedes all intellectual apprehension of a reason for this feeling. At any rate, children of a certain temperament, on being subjected to those painful repressions of their bodily organism which ordinarily call forth signs of anger or fear in other children, cry out with a quality of tone that seems to indicate this emotion. The cry of pain, the cry of anger, the cry of terror, and the cry of grief, have each its peculiar quality. To snatch from the hand of a child some bauble that gives it pleasure will often elicit a grieved cry and expression of countenance. Animals and very young children sometimes evince remarkable signs of this emotion on missing companions that have died or been removed—even to the extent of pining away under it. Doubtless in many of these cases there is present a large admixture of other feelings—such as vague sense of restlessness and discomfort at changed surroundings, feeling of the disturbance of customary objects of perception and trains of mental images, etc. But genuine grief can scarcely be entirely ruled out of our account. This emotion is not, however, so fundamental and universal as are anger and fear; neither is it so likely to arise in a purely unintellectual way. Once originated, few other emotions are more distinctive of one's entire development of ideation and thinking than the kind and intensity of one's griefs. In respect of one's moral nature, what one grieves at in one's self or in others is a clear indication of its general quality.

[1] See The Mind of the Child, Senses and Intellect, p. 164 f.

Joy, as an emotion, is distinguished from mere pleasure somewhat as grief is distinguished from mere pain. Neither the simpler forms of pleasure, which are the affective accompaniments of simple sensations, nor the quiet massive pleasures, that are produced by favorable bodily conditions (feelings of comfort, etc.) or by quiet, low-toned mental activity (feelings accompanying reverie, etc.), seem to deserve this name. Intensely pleasureable states which have their basis in the feeling of presentations of sense that strongly excite memory and imagination, or of anticipated presentations of sense, with the well-known agreeable somatic reaction, are most properly called "emotions of joy." Here again we find the early, radical, and more purely instinctive exhibition of the emotion in the barking and springing with which the dog greets the sight of his master taking down his gun, or the glad cry of the infant at the sight of his nursing-bottle or his favorite toy.

D. A sort of animal *Astonishment*, or wonder, is closely connected with fear and grief. Yet there is an emotion corresponding to this word, which appears very early and is an almost wholly unintellectual feeling, that is neither fear nor grief. Preyer,[1] indeed, speaks of it too loosely when he declares it to be "essentially different from surprise." The latter we have already treated (p. 176 f.) as a primitive form of feeling called out by any new sensation, especially if it be sudden and somewhat intense. But *new* impressions of any kind may create surprise; for this feeling *is of* the change in the sensuous or ideational current of consciousness. The character of our feeling, whether we call it surprise or astonishment, is modified as we increase its intensity or connect it more closely with a recognized intellectual basis, and get the full expression of the resulting bodily resonance. When some wholly strange presentation of sense suddenly occurs, and the intensity of the resulting feeling becomes so great as partially and temporarily to paralyze certain muscles and to overpower discriminating attention, we get, in its purest form, the phenomenon of astonishment. In a milder form we see the same emotion exhibited in the wide-open eyes and gaping mouth of the ignorant adult when viewing some spectacle. But in its more refined form of "intellectual wonder" it resembles the emotion or sentiment which develops from a somewhat different root—that is to say—

E. *Curiosity*, which, even as a semi-intellectual affair, belongs to the lower animals and to very young children generally. Doubtless we should exaggerate, if we ascribed solely or chiefly to curiosity, or to desire to analyze and investigate, the eagerness with which the infant boy tears in pieces his toys, or the sniffings of the dog at every new object he encounters. A certain almost purely reflex or automatic physiological restlessness and pleasure in activity of any sort lie much at the base of such actions in young animals. Let us, for example, present any bright and tinkling thing before the eyes of an infant. It will not long satisfy him *for us* to shake the bauble about for his amusement; the child will soon stretch out his hand and undertake *to perform for himself*, to his more lasting delight, a similar action. But when this "motor" familiarity is obtained with the new object, what more remains? Now it is not improbable that, from the very first, some vague form of semi-intellectual curiosity is mingled with the activity of the

[1] The Mind of the Child, Senses and Intellect, p. 173 f.

child. And how shall we surely distinguish between this and intellectual restlessness? For it must not be forgotten that the ceaseless craving for activity of the young animal is itself by no means a purely muscular or physiological affair. The rather is it partly a psychical restlessness, an instinctive reaching out for the pleasure of psychical activity. But such psychical activity is, from its very nature, analytic and explanatory. The tendency to ideate and to think, passing with redistributed attention from one object to another, and pleasure in the exercise of this tendency, may be said to antedate any definite "intellectual curiosity." Yet this mental condition is very nearly akin to intellectual curiosity.

To this must soon be added an experience of certain practical benefits arising from the exercise of the psychical powers in the mastery of new objects. A more truly intellectual curiosity is thus awakened in necessary and close connection with the pursuit of practical ends. This effect transforms the almost animal psychical restlessness into an important sentiment, and by increasing its intensity it may be made to acquire emotional characteristics—as we shall see later on.

F. The case of *Jealousy* further illustrates the correct theory of the development of the kinds of higher feeling. In this case, however, there would seem to be no possibility of arousing even the most primitive form of the feeling without a basis in some development of the life of presentation and ideation. Many of the lower animals and very young children, indeed, show marked signs of jealousy—as anyone knows who has watched the behavior of a favored dog when his master is petting another animal (dog, or cat, or even human child, it may be). But here the intellect is not inactive; the feeling is not blind, but rests on recognized grounds, such as the perception or imagination of other objects in certain suggestive relations to each other. Jealousy is, however, a natural form of feeling that cannot be resolved into any other, or accounted for simply as a modification of pleasure-pain produced by presentation and ideation in a secondary way. In the history of animal species it may well enough have been, and to a certain large extent still is, a necessary factor in their preservation and development. As a manifestation of instinctive feeling in human offspring it works in the direction of limiting the cherishing parental attention; and in the mind of the female it serves as the warning and corrective of the male disposition to transgress the bounds of the family in the bestowment of care and affection upon the other sex. Refined and controlled, it develops into a noble ethical or æsthetical sentiment which serves as the safeguard of most important interests; and in the sphere of religion, what would become of the world if all the souls "jealous for God" were removed from it?

G. The feeling of animal *Sympathy* is, in some respects, the opposite of the feeling of animal jealousy. In its most primitive form it appears as a kind of instinctive outgoing of emotion which is excited by the signs of emotion in other beings, especially of those belonging to the same species. There is very likely something farther down than, and back of, even this—of which, however, it is difficult for psychology to give an account. At any rate, waves of impulsive action that seem to have their cause in the rise (all at once and with scarcely discernible means of intercommunication) of wide-spreading common feeling, welling up out of the unconscious above the

threshold of consciousness, are not uncommon phenomena among the lower animals. And in man's case, all our most subtle analysis does not always serve to discover why whole communities have been simultaneously swayed with common emotions. But however this may be, the "principle of imitation" is obviously very powerful in the excitement and development of sympathetic feeling. We have already seen (p. 231 f.) how primitive and universal this principle is in the sphere of bodily movements. But it was then remarked that the movements, which originate imitatively, are difficult to separate from the existence, at least in vague and inchoate form, of the ideas and feelings which the movements express. Sign and psychosis—that is, movement significant, and ideation and feeling signified—are not loosely correlated; from the first, they are almost like two sides of one and the same mental reality.

It appears, then, that what is called "animal sympathy" is scarcely to be spoken of as *a* form of natural feeling. The rather is it a sort of general instinctive tendency to "harmonize" consciousness, as it were. All the foregoing special forms of feeling—anger, fear, grief, curiosity, and the like—are so much a matter of human nature, on its affective side, that they exist as feeling, and develop in dependence on ideation, in the most primitive stages of mental life. Thus groups of children are altogether likely to get angry together, to fear, to grieve, to wonder, in company. The more distinct craving for sympathetic feeling from one's fellows is a later manifestation of mind. It is difficult to say whether or not it precedes experience of the soothing nature of pity and of its caressing manifestations, as they, to a certain small extent at least, belong to the earliest environment of the human infant. No doubt the more intelligent and principled forms of sympathetic feeling are dependent upon finding out the truth that—

> "Fellowship in woe doth woe assuage,
> As palmers' chat makes short their pilgrimage."

The development of this manifestation of human emotional life, however, belongs especially to the class of ethical and æsthetical sentiments.

§ 3. It should further be noted of all these forms of feeling that, in actual adult experience, they are seldom experienced except as compounded, as it were, according to certain relations existing between them. Certain kinds of fear, for example, cannot exist without a mingling of the emotion of anger; and the same thing is true of some states which we call grief. While jealousy—as we might expect from its higher ideational character—rarely fails to be a compound, in the case of the adult, of anger and grief, and perhaps also fear. *This union of emotions is so intimate that it is not to be described as a succession of different emotions simply, but rather as a fusion of different primitive emotions in one complex affective condition.*

The Difference between the Emotions (or Passions) and the Sentiments is not fixed; it is rather a variable resultant from the four conditions, already maintained, which enter into all development of the higher and more complex feelings. In general, great intensity and consequent strong "bodily resonance" are

characteristic of the emotions and passions. A much lower intensity, and a far larger admixture of influence from ideal considerations, are characteristic of the sentiments. It follows also, from the increased presence of the developed life of imagination and thought in the sentimental forms of feeling, that their complexity is usually greater than that of the emotions. But there is probably no form of sentiment—not even the most ideal, whether in the class of the ethical, or the æsthetical, or the religious feelings—which is not tinged with some discernible form of the same so-called bodily resonance which is so much more obvious in the coarser emotional states. On the other hand, if we increase the intensity of any of the most ideal sentiments, they at once show tendencies to assume an emotional phase. With enough of intensity and reactionary feeling from the induced bodily condition, all sentiments become indistinguishable from those states which we do not hesitate also to call emotions. Moreover—as has already been made quite obvious—any typical form of human feeling may be, at one time, exhibited as an emotion, at another time as a sentiment; and individuals of different temperaments and different culture have essentially the same primitive feelings in the form of either emotions or sentiments.

§ 4. The truth may be illustrated by considering, in its changing phases, any one of the typical forms of feeling enumerated in § 2. Indeed, the hints there given as to the course of development followed by all the composite feelings, enforce the same truth. But to take another illustration, let us consider the mother's feeling of affection for her child. Within a few minutes even, this feeling may pass from a mild and half-conscious affection to a pronouncedly sentimental stage, as she thinks of his promise intellectually or of his return of her affection for him; or as she imagines the time when her hopes regarding his future will be realized. But instantly, the sight of danger to him, or the news of harm to him, may cause the feeling of love to mingle with fear and grief, and stir it up to all the intensity and "somatic reaction" necessary for a highly emotional phase. With respect to all this, the very words "emotion" (suggestive of feeling as furnishing force, acting dynamically), and "sentiment" (suggestive of thinking sensibility), are significant. That animal wonder, or curiosity, also, which we have seen to be capable of development into a refined sentiment, only needs the addition of unwonted intensity and of its result upon the bodily organism, to assume an emotional form. Thus we read of that queen of Prussia who met death with joyful readiness, rather than fear, because she should soon "know the truth of the things about which the philosopher Leibnitz could not tell her." Closely connected with the feeling of curiosity is the feeling of pleasure which comes from discovery—whether of some simple fact new to us, or of some important principle new to the race; and this, again, is akin to the pleasure of the highest productive energy. This feeling, too, may take the form of that lofty sentiment which led Niebuhr to compare

his joy at contemplating one of his own finished works to the divine joy in the completion of an act of creation. But of Gay-Lussac, the French chemist, we read that, on making an important discovery, he threw down the utensils and danced about his laboratory with the pleasurable emotion which this discovery gave him.

Indeed, it would not be easy to mention a single one of the more simple and primitive forms of feeling which may not develop after either the emotional or the sentimental type. Thus the milder forms of expectation, in view of the more remote realization of ideals, may not improperly be spoken of as sentiments; but when expectation is intense and connected with the bodily condition which precedes the gratification of some appetite or desire, it is often of a highly emotional character. Doubt also is capable of being more or less distinctively either emotional or sentimental. Even the feeling of excitement itself is markedly different when it originates in the quickened character of the more purely mental train, without sufficient intensity to arouse a strong bodily resonance. While vague animal craving contains within itself the possibilities of being developed either into the mixed emotion that rests so largely upon sensuous conditions at the great climacterics of life, or into the sentimental longings which, in more refined natures, characterize the same periods. The feeling of monotony, in the intenser forms belonging to coarse natures, causes strong somatic reactions and is itself made thereby more emotional; but it is the highly intellectual, as a rule, who feel most of the yet keener miseries of the sentiment of *ennui*. For, in truth, every kind of feeling falls under the same principles of development which we are illustrating.

The characteristic Nature and uniform Course of the Development of the Emotions is, then, tolerably plain—whether as respects their physiological basis or their description and explanation as states of consciousness. Since all forms of feeling, when intensified so as themselves to feel, as it were, in a secondary way, the bodily resonance they occasion, become emotional, the development of each kind of emotion, as well as the development of the entire life of emotions, requires us to consider the somatic influences that are distinctive of them all. The general physiological theory of all affective phenomena thus connects itself at once with what has already been said concerning the physiological basis of the entire life of feeling. Accordingly, the description of the physiological conditions of any developed state of decided emotional character may be given as follows: The growth in intensity of the original feeling causes, and is correlated with, the increased intensity and wider spreading of central nerve-commotion. This large amount of centrally initiated nerve-commotion itself overflows and passes down the nerve-tracts which connect the brain, centrifugally, with the internal and external organs of the body. These organs are thus put into a changed condition of tension or relaxation (as in the case of

the muscles), of quickened or slower activity (as in the case of the heart, the lungs, the vessels of venous and arterial circulation, the secretory vessels, etc.), of temperature, and of various obscure and ill-localizable forms of sensuous irritation. This changed condition of the peripherally-lying organs now, in turn, reacts upon the central organ which initiated them; and further intense and wide-spreading nerve-commotion, having an external origin, is occasioned in the brain—to mingle with, and supplement and modify, the original centrally initiated nerve-commotion. Thus an emotion, physiologically described, may be considered as a sort of nerve-storm which gathers intensity, at first, in some comparatively limited region of the brain, but quickly spreads from storm-center to storm-center, as it were; which sweeps down the different paths of exit upon the lower centers and upon the different systems of muscles, upon the vascular and secretive and respiratory systems; and then, from all these peripheral parts, return currents sweep backward further to disturb the centers that lie within the brain.

Psychologically considered—that is, as a rising and predominating condition of consciousness, or succession of affective states—an emotion has ordinarily the following history: Some form of feeling arises as the affective accompaniment of a certain presentation, memory, imagination, or thought. For certain reasons, connected with the disposition, mood, or more definite past experience of the individual mind, the object which excites affective consciousness is fixated by attention, and associated with trains of mental images that tend to intensify it. But as the feeling increases in intensity it changes in mixed quality; for we begin, although perhaps without recognition of the fact, to feel our own contracting or relaxing muscles, the quickening or slowing of our heart-action, the rhythmic movement of the respiratory apparatus, the various visceral stirrings, manifold and not easily describable skin-sensations, and indeed all the obscure as well as more obvious workings of the *expressive* results, within the bodily organs, of the feeling itself. Thus, psychologically considered, all the Emotions are seen to have certain common characteristics; these may be summed up as their general "emotional" character or tone—*an important part of which is constituted by that content of the affective consciousness which depends upon intense and widely diffused cerebral agitation, whether centrally initiated or due to the secondary effects of "bodily resonance."*

The complete explanation of the differences in the content of affective consciousness corresponding to the different so-called emotions—anger, grief, fear, joy, and the like—is to be found,

both in that original difference which the initial feelings bear, and also in the secondary and induced differences due to the different complex characters of the bodily resonance. When one is very angry at an act of injustice or an insult, one is plainly in a different state of mind from that which we characterize as great fear—whether of a personal attack or of the expected loss of a beloved friend. Yet, these two emotions may fuse pretty completely in one condition of mind; and, even as considered apart, they have marked common characteristics. Their differences, however, may be even more marked; and in the case of contrasted emotions—such as grief and joy, or hope and despair, or love and hatred—the unlikeness is the obvious and impressive thing. In explaining all such differences, psychology can neither attribute it entirely to somatic reaction, nor leave such bodily influences out of its account.

Certain characteristic differences in the somatic reaction serve, although in a somewhat indefinite way, to classify the emotions. The pleasurable emotions differ in general from the unpleasant, as follows:[1] In the former all the superficial vessels of the body (vaso-motor, secretory, etc.) tend to dilate, the muscles (voluntary and involuntary, and especially the respiratory) are more intensely innervated, more highly "toned," the visceral stirrings are indicative of increased molecular activity—more alive, as it were—and the extent of the heart-movement is increased. But in many unpleasant emotions the opposite of all this takes place: the superficial vessels are constricted, the innervation of the muscles is disturbed and loses tone, the vaso-motor system within the body also becomes "atonic," and the extent of the heart-movement is diminished. This account of the origin, in part, of the difference among emotions, as regards their tone of pleasure or of pain, agrees also with what has already been urged respecting the physiological basis of all feeling and of pleasure-pain in general (comp. p. 173 f.). Like every other such account, however, it is only partial; it must be infinitely varied and modified in its applicability to individuals; it is in every case itself dependent upon other physiological and psychological laws.

§ 5. In order to understand the part which the "bodily resonance," or "somatic reaction," plays in the characteristic content of all the emotions, it is necessary again to refer to the immediate effect of increasing the *intensity* of the initial feeling. This effect is, of course, connected with the whole doctrine of the focusing and redistribution of attention. Our feel-

[1] Comp. Lehmann, Die Hauptgesetze d. menschlichen Gefühlslebens. Uebersetzt von F. Bendixen, p. 110 f.

ings are—it has been shown already—interesting; and they determine largely the presentations of sense, or the images, or thoughts, which get superior recognition in the stream of consciousness, and, as we say, "fix the mind" upon themselves. But attention is, physiologically considered, distinctively a cerebral process; it implies increased circulation and molecular activity in somewhat definitely localized regions of the brain. On the other hand, the very direction of attention to the initial feeling tends to intensify it. "Do not *mind* the insult if you do not wish to get more mad over it." "Do not *think* of the lost object or opportunity, if you would keep down your grief," etc.—so do we bear witness to the intensifying influence upon the feeling of the attention it commands. Again, as the intensity of the affective accompaniment of my perceptions, imaginations, and thoughts, increases, I am inclined more and more to say: "How can I help thinking of that which I so intensely feel?" All this is significant of the fact that the feeling is "working itself up" into the emotional stage.

No considerable intensity of cerebral and concomitant psychical excitement can exist, however, without quickly and profoundly influencing the peripheral parts of the body—the different systems of organs, both external and internal. This is a psycho-physical necessity of the first rank; it is due to the very structure and functions of the nervous system, and to the natural relations which this system sustains to the states of consciousness. This fact is the general explanation of that marked effect which all highly emotional states have upon the heart and bowels and respiratory apparatus especially, but also upon the muscles of the trunk, head, and different main external members of the body. Such connection is consecrated by, and even inseparably embodied in, all our language. Hence arises the tendency to locate the emotions in these parts of the bodily organism rather than in the brain. Shemitic peoples particularly emphasize the viscera and their behavior and condition as indicative of character. The "soft" heart and the "hard" heart, the "good" heart and the "bad" heart, and all the language of poetry and of common life are in evidence here. The swelling of pride makes men carry the "head high" and step with a strutting gait—this when it is coarsely emotional; but when of a more sentimental order, the same feeling retreats within, as it were, and both occasions and feels far less of purely somatic reaction.

We note as strongly confirmatory of the same view, such common experiences as the following: We all tend toward the emotional condition of consciousness whenever any rise in the intensity of the total conscious state *suddenly* occurs. In general, the saying is justified, that from mere feeling to emotion is a "leap." This leap may be produced by a quick and decided rise in the sensational content of consciousness, even when such content has little or no meaning; as in the case of the leap to anger, or fear, or wonder, which loud noises and bright flashes of light and strong skin-sensations occasion. It may also be produced by that rapid rise in the feeling of effort which takes place when, the motor apparatus being duly set to produce a given result, we find ourselves unexpectedly resisted. Most men are strongly tempted to get angry at the resistance of the inert object which excites such a sudden rise of feeling. Jars and shocks of every kind tend to throw us into the emotional condition of consciousness. By recurring here

to Weber's law, which shows us that the felt intensity of the feeling depends upon the suddenness in the change, we find a partial explanation of all such phenomena.

§ 6. The marked effect of *assuming* the conditions of body expressive of the various emotions, upon the heightening and perpetuation of the emotion itself, is in plain confirmation of psychological theory. If one begins to feel angry, one may diminish or intensify one's feeling and so keep it below or raise it above the emotional stage, according as one represses, or indulges it, in respect of a very considerable amount of bodily resonance. This principle can primarily apply, of course, only to such forms of somatic reaction as are voluntarily controlled. Here, too, much allowance must be made for individual disposition and development, and even for marked idiosyncrasies. Some persons can shed tears almost, if not quite, at will, and with as little emotion as that which some others feel in moving their ears. Cases are not wanting of those who can directly control the heart-movement, without experiencing either preceding or subsequent emotion; and of those who, with no emotional excitement, can "contract the facial muscles in any mimetic combination[1]." Naturally, however, and in far the greater number of cases, mimicry of the bodily conditions expressive of any emotion is impossible without corresponding effect upon the affective content of consciousness. In proof of this, the experience of the average man or woman may be confidently evoked, as well as that of the psychological experts—among whom Fechner,[2] for example, testifies that for the grave professor even, "to go tripping and mincing after the fashion of a young woman puts one, so to speak, in a feminine frame of mind." Here again the testimony of the most celebrated actors as to the bodily effects of their acting highly emotional parts, is instructive.[3] "Playing with the brain," says Miss Murray, "is far less fatiguing than playing with the heart." Acting with emotion, as we have seen, *is* working intensely with *both* brain *and* heart.

The view, however, which reduces the entire character of the various emotions, as affective phenomena, to mixtures of bodily sensation, and thus maintains that our bodily changes constitute all there is of any emotion, not only inadequately represents the facts of consciousness, but contradicts the correct theory of feeling from the very beginning all the way through.

§ 7. The details of the different physiological changes connected with the different emotions, and of the related science of physiognomy, do not affect the general theory of the emotions; nor can we do more at present than briefly illustrate this theory. In severe emotional anger, for example, the disturbance of the muscular system is especially marked. Certain muscles, such as those which clench the fists, set the jaws, brace the lower limbs, etc., become intensely innervated. The rhythm of respiration, the muscular quality of the action of the diaphragm and epiglottis, and of the muscles that effect ebullition of the chest and dilatation of the nostrils, are profoundly modified. Especially marked also is the effect upon the action of the heart and upon all the connected vaso-motor apparatus. But there

[1] See the experience of Professor Sikorsky, of Kieff, Neurologisches Centralblatt, 1897, cited and commented upon by Professor James, The Principles of Psychology, II., p. 465 f.

[2] Vorschule d. Aesthetik, p. 156.

[3] See William Archer: Masks or Faces? p. 129.

is pale anger as well as flushed anger; and with many persons the trembling of the lips is more observable than the setting together of the teeth; the tottering than the bracing of the lower limbs. Much depends not only upon the physical condition of the patient, but also upon the kind of emotion—whether hatred or fear or grief, etc.—which is mingled with the anger. The intense emotion of hatred[1] partakes of all the prominent bodily reverberations of anger; it is indeed in this regard almost indistinguishable from it. In emotional hatred we have to notice the grinding teeth, threatening or defensive gestures and poses of the tense muscles, the contracted or wide-open conditions of the eyes, the convulsions of the lips, vocal organs, and facial muscles. In both anger and hatred the feeling *of* the abdominal disturbances as a general coloring of consciousness rather than as localized bodily sensations, and *of* the changed conditions of the capillary circulation in the skin ("goose-flesh," creepings, and changes in temperature-sensations) are prominent features of the emotion.

The emotion of fear[2] when sudden and overpowering, has certain characteristics of an organic sort in common with anger and hatred. In other characteristics its somatic tinge is the opposite, as it were. Here a temporary paralysis of the muscles, rendering them either immovably rigid or trembling under insufficient cerebral control, is distinctive. Thus the badly frightened man "stands like a statue, motionless and breathless, or crouches down as if instinctively to escape observation." His heart beats wildly or faintly, and pallor of skin, with cold perspiration, become noticeable. Indeed, this effect upon the exudations of the skin is one of the most distinctive characteristics of the somatic reactions of this emotion. Inside the mouth the membrane is dry through imperfect action of the salivary glands; and this, with the trembling of the muscles used in vocalization, accounts for the husky and indistinct voice of the "terror-stricken." Indeed, the voice sometimes refuses at all to obey the will (*vox faucibus haesit*). But grief, when strong and sudden, and accompanied by sobbing and convulsive respiration, is, in respect of its bodily resonance, somewhat like a mixture of anger and fear. If long continued, it bears the marks of that generally flaccid condition of the muscles and anæmic condition of the blood-vessels which is characteristic of the painful emotions. The bent neck, the relaxed cheeks and jaws, the collapse of fiber around the shoulders, the hanging arms and dragging legs, the slowed respiration and heart-beat, indicate the one; and the pallor and shrunken expression of the skin and chilly sensations, indicate the other, of these effects. But the opposite of all this is the bodily condition which results from, and resounds in, the emotion of joy. Yet either of these opposite emotions may stimulate the lachrymal glands to weeping and disturb the peristaltic movements of the intestines.

§ 8. It would be a mistake, however, to consider that these grosser forms of the more animal emotions alone fall under the influence of what we have called a characteristic bodily resonance. Unmanifested emotions of anger, hatred, love, joy, grief, wonder, and the like, often burn much the longer and even more intensely. Indeed, to give expression to these

[1] Comp. Mantegazza: La Physionomie et l'Expression des Sentiments, p. 140.
[2] See Darwin: Origin of the Emotions, p. 290 f.

emotions—"to out with them," as the saying is—frequently results in greatly diminishing their inward intensity. What the great poet said of anger is true of them all; they are "like a full, hot horse, who being allowed his way, self-mettle tires him." This experience is partly explained by the fact that *in their highly emotional form all the feelings run, as it were, a sort of limited physiological career.* The storm rises in certain centers, breaks over into others, culminates, and subsides again. If it is not allowed to do this, through restraint from some other feeling (as where fear inhibits anger) or from some ideal consideration (such as notions of propriety, of self-respecting conduct, or of duty), the feeling may maintain a longer and higher stadium of interior intensity. In such cases, however, the influence of certain somatic reactions is no less truly recognizable. The man who nurses but does not display his anger, grief, fear, hatred, feeling of joyful triumph or of gratified pride, or even of restless curiosity, keeps it warm and lively by means of much concealed activity of the muscular, circulatory, digestive, and vaso-motor systems. An interesting illustration of this truth is to be found in the reciprocal influence of mind and body for the support of the emotion of *chagrin.* This emotion is of all perhaps the most indefinable with respect to its bodily characteristics, the most concealed and inexpressive by way of obvious conditions of the organism. Yet its somatic reaction resembles a kind of slow-burning grief in the effect produced upon the muscular and respiratory systems; and the conjecture that the emotion actually poisons the arterial circulation and feeds itself upon its own poisoned blood, is not altogether without proof.

§ 9. Finally, we note how the continued reduction of intensity, as such an effect is brought about in the individual or in the race by the development of varied ideal and ethical and religious considerations, tends to transfer them from the emotional into the sentimental stage. The æsthetically pleasing result of all this is the substitution, for rankly physical emotions, of the more delicately constituted corresponding sentiments. But when suppression of conscious life on the side of the more complex feelings takes place, the result is both æsthetically and ethically unpleasant. It must indeed be admitted that human feeling is not now so bodily strong and coarse in many communities as it was among our savage ancestors; or—to quote from a modern novelist—as in "the days before the habit of taking long views had reduced the emotions to a monotonous average;" but it must also be remembered that this does not necessarily signify the slowly approaching death of all feeling. Some are skilfully refining their emotions into intellectual, æsthetical, and ethical sentiments; while others are growing less human by a selfish reduction of the life of feeling to an improper subserviency. Yet the blood of the race is still red and warm, and there are indications that the shallows of *dilettanteism* among the so-called upper classes may ere long be submerged in the strongly and swiftly flowing emotional currents of the popular life.

All considerable increase in the Intensity of Feeling tends also to change profoundly the character of the train of associated Ideas and Thoughts. In turn, the changed character of

the conscious intellection may be felt as intensification or modification of the rising emotion itself. Here we recur to what was formerly said about so-called "feelings of relation" (p. 186 f.). In dependence upon the time-rate of the mental train we experience feelings of excitement or tedium, etc.; in dependence upon changes in the complex quality of our perceptions, imaginations, and thoughts, we experience feelings like those of novelty, or monotony, bewilderment, or pleased recognition, etc. But as the storm of emotional excitement rises and swells, the time-rate of the ideas and thoughts is necessarily altered; clear perception becomes difficult or impossible, and likewise clear definition of our imaginings and reasonings. "Hasty" feeling and "deliberate" reflection, "heated" emotions and "cool" thoughts, cannot swim together in the same portion of the stream of conscious life. This incompatibility is, indeed, not strict; and the limits of it vary greatly with different individual cases and persons. There is no doubt on the whole, however, concerning the marked disturbing effect of greatly increased intensity of feeling upon the intellective side of consciousness. But *the very feeling which produces the disturbance of ideation and thought is destined in turn to feel this disturbance.* This form of secondary reaction may be considered, physiologically, as resulting from the centrally initiated nervous agitations which, while they proceed from brain-center to brain-center, effect changes simultaneously in the physical basis of both feeling and intellection. Or — to refer again to the general physiological theory of feeling (p. 193 f.) — the "semi-chaotic surplus" of cerebral nerve-commotion rises to such an extent as relatively and temporarily to overpower those more orderly and law-abiding neural processes on which clear ideation and thinking depend. Ordinary experience affords plentiful illustration of this result as a purely psychological phenomenon, a process in consciousness, as such. Any rising flood of emotional excitement, as all well know, upsets our orderly trains of mental images and, especially, our power carefully to draw logical conclusions on clearly recognized grounds. But this very "upsetting," if it cannot be reduced or controlled, not only adds to the initial emotional excitement, but may greatly change its character while increasing it. Thus extreme anger, or grief, or hatred, or fear, or love, may all tend to come together, as it were, in an unspecialized emotional condition; somewhat as all color-tones, when made more and more intense, tend to become whitish and merge in one tone-less visual sensation.

§ 10. The effect upon the accompanying feelings of changing in an unaccustomed way the time-rate or qualitative relations of our ideas may be tested by another class of experiences. Let it be assumed, in some particular instance, that this effect is *not* initiated by an increased intensity of feeling itself; that one's perceptions or thoughts are not disturbed by anger, fear, or joy, originally, but by the way in which the perceptions or thoughts are themselves introduced into the stream of consciousness. Such an effect may occur when we are looking at a too rapidly moving series of objects in which we are interested, and of which we wish to obtain adequate perceptions; or when we are attentively listening to one speaking too rapidly; or are forced to hurry through an important book; or are attempting, as spectators, to watch the flitting phantasmagoria of our own half-waking, half-dreaming consciousness. In all such cases, we soon begin to feel a sort of tension toward an emotional tone of the entire conscious life. The feeling of the "hurly-burly," that is, tends to become an emotion which is a mixture of the feelings of excitement, vague dread, half-indignation at our thoughts for tricking us so, etc. Yet again, when the bodily sensations are markedly strange and unaccustomed, either as respects their intrinsic quality, or their relative intensity, or their order of arrangement, it is not easy —for most men it is impossible—to avoid being thrown by this experience into an emotional state of mind. Of this those know, alas! only too well who are accustomed to all those strange sensations about the head which belong to certain conditions of nervous exhaustion; or who possess that wretched "inner eye," to watch the vital processes of digestion, which characterizes dyspeptics. The effect upon the emotions of certain drugs is largely indirect in this way. They upset the trains of associated ideas, hurry them up or slow them down, and introduce unwonted fanciful forms into them in ways which neither memory nor reason can trace; and, therefore, in this secondary way (in part, at least), they produce melancholia, maniacal joy, or the emotions of enormous pride or of exultation in the expansion of one's spatial and temporal universe.

The reactionary effect upon the emotion of these changes in the intellective aspect of consciousness which it has itself produced, is only a special case under the general principle: *the complex life of feeling depends for its character upon the development of ideation and thought.*

§ 11. It is evident that we have, in every case of emotional excitement, one of those exceedingly complicated problems which require for their complete answer a knowledge of the mental history and constitution of the individual whose case it is. In every case, however, the general conditions of consciousness—its limits, circuit, and complexity in unity (comp. Chap. III.), are faithfully observed. As the relative amount of feeling of which different persons are capable varies not less than their capacity for imagination and thought, so does the amount which they can "stand," as it were, without greatly disturbing imagination and thought. Indeed, with every person a certain excitement of feeling is favorable to quickened and heightened memory, to productive image-making, and to ratiocination. But here the range of individual differences is very great. For with some a slight emotional intensity speedily produces confusion of thought, loss of memory, interruption of the train of ideas. In respect of such marked effect of feeling

on intellection, there is also a great difference between the different kinds of emotions. The "expansive" emotions—such as pride, self-satisfaction, moderate excitement at the novelty of one's situation, love of approbation, and expectation of applause—most frequently, when kept within certain indefinite limits, are favorable to increased and more effective intellectual activity. While other emotions, such as shame, fear, self-distrust or self-loathing, monotony, and ennui, depress and limit this activity. Here again the place for individual idiosyncrasies is indefinitely large. A small trace of shame or anxiety, or even of pride and love of approbation, will upset some persons more than a relatively large amount of fear or anger. The latter emotion (anger), indeed, operates very differently, in different cases, in its effect upon the intellectual powers. Some men are at their very best intellectually when they are very mad. This fact doubtless rests largely upon a physiological basis; it requires for its realization a sound heart and lungs, in order to meet the demands which the emotion makes upon these organs for rapidly increasing action. It is also significant, perhaps, of general robustness of character. Here again we may refer to Dr. Martin Luther's praises of the excellent effects, in his own case, of occasional strong outbursts of this passion. And Balzac makes Louis Lambert say: "Anger, like all our passionate expressions, is a current of human force acting electrically. . . . Do we not meet with men who, by such a discharge of their volition, reduce and refine the sentiments of the masses?" On the other hand, all the faculties of other men shrivel under the influence of anger; with them it shows itself as a depressing and contracting emotion. According to the author just quoted: "Passions are either defects or virtues in the highest power."

Considerations like the foregoing are of great importance, not only for the understanding of psychology as a science, but also for the correct appreciation and intelligent control of our fellow-men. For, as the very word signifies, it is the "emotions" that *move;* and yet so varied and complicated are the kinds and directions of movement thus produced, that no generalization of high import and wide-reaching application can ever be attained.

The foregoing considerations fitly introduce us again to the Complexity of the Emotions, considered as highly developed forms of feeling. The increased complexity of feeling in dependence upon the increasing complexity of the intellectual life is to be understood only in connection with the entire history of intellectual development. Hence new kinds of emotion arise as the general evolution of our conscious life goes on. Even in those cases where a rapid transition takes place from one form of intense feeling to another, or where "conflict of emotions" occurs, the resulting state may be recognized as a really new kind of emotion.

A modern writer[1] on the psychology of feeling confirms his view of the relativity of all feeling by the following common-

[1] Höffding, Outlines of Psychology, p. 279.

place remark: "In some cases wonder turns to fear, disappointment, and contempt, or to joy, love, and veneration, according to the nature of that which has excited wonder." For this reason Descartes and Malebranche "permitted wonder to head the series as presupposition for every one of them." But this author considers it more natural to class wonder (as Bain also does) among the "emotions of relativity." To this view we have agreed. What needs now to be noticed in addition is this: as "wonder turns to fear, to disappointment and contempt, or to joy, love, and veneration," its own character as wonder becomes profoundly modified. *Thus by fusion of different emotions, in the very process of "turning," or transition, new complex emotional states arise.* Different kinds of wonder—fearful, contemptuous, joyful, loving, venerating—are thus produced, to the indefinite enrichment and furthering of the development of the life of feeling. Were there no kinds of wonder beyond nearly blank, almost undifferentiated, half-animal wonder, or wonder mixed with fear and contempt; with what fitting emotion should man greet the rising conception of Infinite love or moral power?

The insufficient reason which led some earlier writers to "permit wonder to head the series" would apply, with almost equal cogency, to every important form of natural feeling. Each such feeling may be placed at the head of a series, under which may be ranged all the principal modifications of the dominant emotion by admixture of other more or less strongly toned emotions. Thus love may head one list, and grief another, and joy a third, and fear and hope still others. As Professor James has truly said:[1] "There is no limit to the number of possible different emotions which may exist . . . Any classification of the emotions is seen to be as true and natural as any other, if it only serves some purpose." In pursuance of our present purpose we might then classify love—for example—as timid love, disappointed and grieved love, contemptuous love, joyful love, venerating love, etc. Or, beginning rather with grief, we might permit it to head another series. Nor would the limits of possible complexity be reached when we had made all imaginable dual combinations; for experience shows us states of emotion where three or even more characteristic tones of emotion seem fused into an "emotional consonance" or "dissonance," as it were.

Especially interesting in this connection are those conflicts of emotion with which all highly developed emotional natures make the student of life familiar. In all of them the affective

[1] These statements are, in the main, true, although the reasons with which the author enforces them are, in our judgment, inadequate. The Principles of Psychology, II., p. 454.

side of consciousness is not properly described as simply a change from a thin but intense stream of one kind of feeling to a similar stream of another kind; the rather is the whole landscape of the soul like that we see in nature when lights and shadows, spots of cloud and storm and spots of sunshine, form a mingled whole. The field of affective consciousness is almost always a *chiaro-oscuro*. The emotion that comes from having the heart torn between the call of duty and the pleadings of natural affection, for example, or between love of the object and hatred of his conduct, or between pity for weakness and contempt for yielding to it—all this is what makes the tragedy of life, actual or artistic, so profound and so captivating of our earnest attention. This it is which the great works of art—like Antigone, Hamlet, and Lear—put upon the stage. Here we may fitly refer to that tendency of the mind to rebound from one form of emotion quickly to its opposite, to which frequent reference has already been made. In this respect, however, dispositions differ markedly; and different individuals can be understood as respects their emotional development only when we also take into account all the connected development of memory, imagination, thought, and will. The physiological reason for this is doubtless to be found in that general condition of cerebral agitation and extra-cerebral overflow, that loosening of circumscribed centers and opening up of nerve-tracts, which all intensifying of feeling involves.

§ 12. The inadequacy of the theory of feeling which denies that affective states, as such, differ qualitatively, and accounts for all the complex forms of emotion as only "ideationally" different, is again apparent. According to Volkmann[1] we cannot speak of a reciprocal influence of the feelings as such. The influence of feelings on each other—he holds—is only apparent; synchronous feelings inhibit each other because the circles of ideas in which they have their rise inhibit each other; while, for a corresponding reason in the relations of the ideas, the accompanying feelings support and further each other. All this, however, neglects the fundamental character of the affective phenomena of mental life. It is doubtless true that one often passes from joy to grief, or undergoes a struggle between the two emotions, *because*, for example, pleasant news is succeeded by sad news, or the total event under contemplation is partly pleasant and partly sad. But it is also true that emotion itself not infrequently seems to take the lead; all at once we are sad without clearly knowing the reason why, and then matters which, but an hour ago, seemed joyful now seem rather fitted to support and increase our tendency to grief. As to the relation between the increasing complexity of our life of ideation and thought, on the one hand, and the development of the higher feelings, on the other hand, there is much to

[1] Lehrbuch d. Psychologie, II., p. 399 f.

warrant the view of Horwicz:[1] In the more primitive forms thinking quite passes into, and fuses with, feeling; thinking is thus rather a consequence than an antecedent of feeling; but this relation changes with development; thinking becomes emancipated from its connection with the lower forms of feeling. But in the case of the higher feelings again, thinking may be largely dominated by them.

In whatever way, however, we represent the relation between our ideas and our emotions, it is certain that a reciprocal determining influence must be acknowledged in the case of all the more highly developed experience. Indeed, if this were not so, it is impossible to see how human life could really develop and become so largely composed of emotions.

§ 13. Further light is thrown upon the principles which regulate the increasing complexity of the emotions by considering that some of them depend upon organic and mental conditions, or upon relations, which can only be furnished when certain periods of development are reached. This is true in a peculiar way of those somewhat highly specialized and yet complex emotions which belong to the climacterics of human life. Under this class those emotions which belong particularly to puberty have already been noticed. These are a confused and changeful mixture of ill-localized, vague, bodily sensations, of mental unrest and undefined longings, of feelings of mixed attraction and shyness in the presence of the opposite sex, etc. Again the peculiar emotions of the parent toward the child, of the lover toward his mistress, of the husband and wife, or of long-tried and intellectually well-mated friends, are, of course, dependent on the necessary relations being realized. But when these feelings do arise, it is shallowness itself to explain them as though they followed definitely pre-established relations of sensations, ideas, or purposes. The leap of the parental heart toward the child at the sound of its first cry is something that lies too deep for accounting by sums in ideation; and so does the emotion of the youth who falls in love at first sight, or the outgoing of a friend's affection toward his friend.

§ 14. Contrast and abrupt change in the emotions contribute new elements to the complex character of the resulting forms of emotional excitement. The joy of the mother is somewhat different *because* "she remembereth (as 'no more,' as a thing of the past) the anguish." When "remedies are past, the griefs are ended"—not, indeed, utterly ceased as griefs, but changed into a less militant kind of emotion. That which actual change accomplishes so vividly, memory and imagination can accomplish in scarcely less effective form. To reflect upon escape from danger or sorrow adds to present joy a differently toned joy, a pleasurable feeling of security or of gratitude or of relief. Thus the emotions that are contrasted in real nature may indirectly either increase or diminish each other.

> "For if of joy, being altogether wanting,
> It doth remember me the more of sorrow;
> Or if of grief, being altogether had,
> It adds more sorrow to my want of joy."

Hence that "extraordinary state" which, in the Phaedo, is referred to as "an unaccustomed mixture of delight and sorrow;" hence that "secret

[1] Psychologische Analysen, ii., Zweite Hälfte, p. 178 f.

pleasure" which Schopenhauer affirms is the companion of a certain form of grief—that "which the most melancholy of all writers called the 'joy of grief.'"

The treatment of the Teleology of the more complex and developed Emotions, like that of feeling generally as pleasure-pain, has been attempted from the points of view held by comparative and evolutionary psychology. The scientific success of this treatment, however, as explaining the differentiation of the emotions, cannot be called great. In general the following two principles apply to some forms of emotional excitement: (1) The motor reactions called forth as a part of the bodily resonance are adapted for the defence and preservation of the subject of the emotion; and (2) by the application of the principles of imitation and sympathy, these same or other reactions operate for the defence and preservation of a multitude of the same species. Thus the immediate result of anger, or hatred, is to put the individual into the best muscular, vaso-motor, and respiratory condition for defence or attack; the spreading sympathetically of the same emotions rallies the surrounding individuals of the same species to united energies in the same directions. Fear, also, tends to check the uncautious advance into danger and to set up, before thought can have time to draw conclusions, the movements in retreat. In how large a way the development of intellectual wonder is serviceable to the individual and to the race, we shall see more clearly when we have considered its sentimental form. Moderate emotions of joy are directly sanitary for the individual; and, by contagion, when we see their expression in others, we are helped scarcely less than when made subjects of the emotion at first instance. Even grief—though more indirectly through exercise of memory and imagination upon the consequences of conduct—may prove serviceable in a biological way.

We cannot believe, however, that such restricted teleology of the emotions is, on the whole, very satisfactory. Taking all the facts of experience into the account, it is doubtful whether the emotions are, on the whole, "life-saving" and "growth-promoting" functions of body and mind—in the merely biological meaning of the words "life" and "growth." In the excessively intense form in which they all tend to recur, unless checked by the forces of an ideational and ethical development, the emotions expend life and hinder growth. We have seen that, physiologically considered, they are all significant of an "overplus," which quickly becomes an "overflow," of cerebral disturbance. Both the "sthenic" (or intensely innervating) and the "as-

thenic" (or depressing) emotions tend to destroy the mechanism; "the sthenic kill by apoplexy, the asthenic by laming the heart."[1]

But human life and human development, in the wider and higher meaning of those words, would be infinitely less rich and interesting were it not for so varied and mighty emotions and passions, with all the part they have played in history, art, and religion. In a grander significance than biology or comparative psychology can properly recognize, the affective forces have been "serviceable" to the race. If the final purpose of life were *merely* to conserve and propagate itself, there would seem to be as little use for so many and strong emotions as for so much and such qualitatively varied pain. At this point, psychology is compelled to hand over to ethical philosophy rather than to biology the larger problems started by the study of human feeling. Here we find, on one side, the conclusion expressed by Matthew Arnold, as follows:

> "Fulness of life and power of feeling, ye
> Are for the happy, for the souls at ease,
> Who dwell on a firm basis of content."

But, on the other side, the rational faith of Browning:

> "Put pain from out the world, what room were left
> For thanks to God, for love to man?"

§ 15. The lower teleological significance of anger is perhaps most obvious. Of the serviceable results of this emotion Darwin affirms:[2] "The excited brain gives strength to the muscles, and, at the same time, energy to the will. The body is commonly held erect, ready for instant action. . . . Such gestures as the raising of the arms, with the fists clenched, as if to strike the offender, are common." Similarly, Darwin would account for the "unfleshing" of the teeth, in the snarl or sneer of anger, as a survival of the habit of getting these organs ready for attack; although the closing of the mouth "with firmness, showing fixed determination" is considered to be a sign of the serviceable character of the bodily movements connected with the kindred emotion of hatred. The interesting versatility of biological psychology is illustrated further in the view of Mr. Spencer that the distention of the nostrils in anger was caused by the mouth of "our ancestors" being filled with "a part of an antagonist's body," and the angry frown by its utility in keeping the sun out of the eyes when engaged in mortal combat. But the obvious physiological reason that, with mouth closed and respiration quickened, the nostrils must dilate, would seem to be sufficient; and Professor Mosso properly objects that the dilatation of the pupils of the

[1] Comp. Wundt: Physiolog. Psychologie, II., p. 406 f.
[2] The Expression of the Emotions, p. 240 f.

eyes, which accompanies frowning, is unfavorable for distinct vision. The latter authority also correctly remarks that the graver "the peril becomes, the more do the reactions which are positively harmful to the animal prevail in number and in efficacy." But all this is only one of innumerable instances where biological and evolutionary psychology becomes self-contradictory, or at least quite inadequate, in its attempt to explain the whole round of man's psychical phenomena.[1]

The Distinction between the Passions and the Emotions is not such as to require a separate treatment of the former. Emotions which have by frequent repetition become habitual, and are, as it were, backed up by will, may be called "passions." Connected with this difference of the two is the different relation to imagination and to thought. On these intellectual operations the so-called passions may be said to feed, and so to attain the life and heat which give them a persistency not to be found in the distinctively emotional states. On the other hand, the most deeply seated and intense forms of the life of feeling—the "ruling passions," as we are wont so expressively to denominate them—tinge the entire character of our mental images and of our habitual conclusions. Thus the *passionate jealousy* of the king in the Winter's Tale makes him perceive, imagine, and infer, the infidelity of the really faultless Hermione; while the *emotion of jealousy* in Othello sweeps away reason and hurries the will on to the murderous deed. It is for this reason chiefly that, as Höffding says,[2] "Repetition has a different effect upon emotion and upon passion; it weakens the one, and feeds the other." The brooding, reflective character of passion makes it, as it were, press more indelibly into the soul certain ideas and judgments; while emotion tends for the time being toward the obliteration of all ideation and reasoning. The storm of emotion clears up and cools off the psychical atmosphere; it leaves the nervous system and mind alike relaxed. But passion burns with the steady heat of a tropical summer.

Nevertheless, passion is ever ready—especially in some natures—to take upon itself emotional characteristics, and so to flame up and vent itself in greatly increased psycho-physical disturbance; just as even perpetually active volcanoes may have their periods of enormously increased eruptive energy. And, indeed, the distinction between the passions and the emotions, like the distinction between the emotions and the sentiments (and even more obviously), is only a relative one. *A certain continuity of nature runs through the entire series of developments, as respects*

[1] On this subject see James, The Principles of Psychology, II., p. 477 f.
[2] Outlines of Psychology, p. 288.

both intensity and complex qualities, of which the life of feeling is capable.

§ 16. The popular use of the two words, "emotion" and "passion" does not observe any fixed distinction. The etymology of the two suggests, of course, that the side of "suffering," on the part of the subject of the affective state, is emphasized by the latter of these terms (*Leidenschaft*, in German). It was Kant who described the psychological distinction in the following language: "Emotion takes effect as a flood which bursts its dam, passion as a stream which wears for itself an ever-deepening channel. . . . Emotion is like a fit of intoxication, which is slept off; passion as a madness, brooding over one idea, which sinks in ever deeper." In accordance with this distinction is the undoubted fact that men who are known to have strong passions, do not lose thereby our intellectual and moral respect; while emotional men are inevitably regarded as weak, however praiseworthy the individual character of their emotions may be. Yet, as we have already seen, and shall see further in considering the character of the sentiments, the most refined forms of feeling all have their emotional intensities and stages. Life and character are enriched by the occasional experience of them in their highest intensities. For example, he who has never "allowed himself" to be swept away up to the heights of musical feeling, by some such gathering and bursting storm of musical sensations as the Pilgrim Chorus in Wagner's Tannhäuser, is the poorer for lack of having been subjugated by the strength of emotive excitement.

[Besides the works cited at the close of Chapter X., the following may be consulted: James: The Principles of Psychology, II., xxv. Darwin: Expression of the Emotions. Lange: translation by H. Kurella, Ueber Gemüthsbewegungen. Maass: Versuch über d. Gefühle; and Versuche über d. Leidenschaften. Mantegazza: La Physionomie et l'Expression des Sentiments. Warner: Physical Expression. Bell: Anatomy of Expression. Lehmann, translation by Bendixen, Die Hauptgesetze d. menschlichen Gefühlslebens. Sully: Sensation and Intuition, chap. ii.]

CHAPTER XXIV.

THE SENTIMENTS

As the complex life of human feeling develops in more obvious dependence upon the contemporaneous development of imagination and thought, new kinds of feelings are manifested for which we have chosen the term "sentiments." The nature of the sentiments, as distinguished from the emotions, has already been described in a negative way; the former lack that marked intensity and consequently large admixture of secondary feeling due to bodily resonance which characterize the latter. Positively, then, we may now say, the sentiments are the most ideal and spiritual of all the forms of developed feeling. In applying the word "ideal" to the sentiments we should understand that these affective phenomena are the farthest possible distant from such relatively simple and content-less feelings as man has in common with the lower animals. The sentiments are feelings full, so to speak, of ideas; some of them may even be said to be feelings that arise only in the presence of "ideals,"—or of those complex constructions of imagination and thought which the developed mind holds before itself as types or patterns of what is not, but what ought to be. The possession of sentiments implies then—whether their moral quality be considered good, bad, or indifferent—a comparatively refined and highly cultured stage of ideation and reasoning. But by calling the sentiments "spiritual" forms of feeling we mean to emphasize in a positive way the very thing which we emphasize negatively when we assert that they *are not*, like the emotions, obviously built upon a basis of somatic reactions. They *are*, of all our affective phenomena, most obviously ascribed purely to a highly generalized and abstract conception of the *Ego*, considered as freed from all dependence upon the bodily organism.

Here, however, the conclusion made necessary by our entire doctrine of the nature of feeling must not be abandoned. All this is only relative. The sentiments reveal their kinship with the primitive forms of feeling and with their twin sisters, the emotions. It is only in respect of degree that they have this ideal

and spiritual character; they, as truly as all the coarser feelings, may become opposed to, or bereft of, reason; they, too, have underneath them, not only a centrally initiated nervous process but a sensuous coloring derived from the concomitant condition of the peripheral and intra-organic vessels and tissues.

The main Classes of the Sentiments have already been stated to be the following three: the Intellectual, the Æsthetical, and the Ethical.

§ 1. The somatic basis of those æsthetical and ethical feelings which we call "warm" and "glowing" is, of course, easiest to describe. The suggestion that this subject should receive a detailed investigation is one which the experimental study of psychology has only just begun to regard. If a collection and satisfactory exposition of the facts were at present attainable (as it certainly is not), we should still in so general a treatise as ours not be able to consider them. The following illustrations of the true position must suffice. It may, in the first place, be argued that since all the sentiments, when greatly increased in the intensity of their characteristic complexes of feeling, tend to become emotional; and since, when they do become thus emotional, they plainly show the influence (in common with the coarser emotions) of the bodily reactions belonging to them; therefore, they all, even in their most ideal and spiritual forms of manifestation, are, *to some extent*, colored by the same bodily reactions. Such a general argument must be held to be sound and defensible. In connection with that principle of continuity which relates the sentiments to the emotions, we infer the fusion of this bodily and sensuous coloring with certain psychoses among the so-called sentiments, in which direct analysis may not be able to find it.

Illustration may begin by considering those æsthetical and ethical feelings which we have in view of objects called "sublime." Here the very word sublime is significant of our contention. That is *sublime* which is lifted up on high; and that is sublime *to me*, to which I am conscious, in some way, of being drawn or lifted up, or allured to make the effort of lifting myself up. Such an experience cannot, however, be had with any warmth of feeling—that is, there can be no actual psychosis corresponding to the sentiment of the sublime—without the appropriate psycho-physical activity. This activity includes the lifting-up of the eyes, the upheaving of the chest, the deeper inspiration, the quickened circulation, the tendency to widen the extent of the heart-movement, etc., which are characteristic of the gentler "sthenic" forms of feeling. The effort to repress this mild and massive bodily resonance, as well as the effort to become distinctly conscious of it in an analytic way, tends at once to diminish this characteristic form of feeling. But its presence is undoubtedly felt in all experience with this sentiment. Moreover, the different shadings of the sentiment are, to a large extent, obtained only by differentiations in the characteristic tone of the bodily resonance. For example, a highly refined religious veneration or awe is closely akin to the æsthetical sentiment of the sublime. Here we have introduced an element of that mild and massive shrinking, or withdrawal, of vital outgoing which characterizes the somatic reactions of every

form of the feeling of fear (a mixture, therefore, of the expansive and retractive organic conditions).

Those æsthetical sentiments which are appealed to by art in the forms of comedy and tragedy are, of course, incapable of realization without the appropriate bodily resonance. Laughter, or even the tendency to laugh, is impossible as a form of conscious feeling, without admixture of felt physiological processes of laughter or tendency to laughter. This is probably true even of that "exquisite laughter that comes from a gratification of the reasoning faculty"—already referred to—where the merriment is most interior, brain-like as it were, and unexpressed as far as visible tokens go. Here, as in the case of the sublime, the tone of the sentiment may be altered by admixture of slight amounts of other kinds of refined feeling, with their characteristic mild forms of bodily resonance. There is just a tinge, at least, of anger, or contempt in the sentiment of satire; and of sympathy, or grief, in the most cultivated forms of humor. While the sentiments which enter into the higher kinds of tragedy, whether as necessary for its artistic production, or dramatic representation, or sympathetic appreciation, make acknowledged drafts upon the bodily organism for their expression and support.

It is a most interesting psycho-physical question, how much, and what, are the necessary somatic reactions that characterize the moral sentiments. Doubtless, what we call "conscience" is in different men a very different affair—characterized much more by unemotional judgment in some cases, and by unreasoning emotion, or unemotional and unreasoning impulsive "will-work," in still other cases. In all cases, doubtless, also, conscience is a very complex development. But even its most characteristic and universal form of sentiment—the feeling of obligation, the feeling of "the ought"—does not seem to be free from somatic influences. The pale and completely intellectualized concept of obligation, could such a form of mental life be realized, might have its bodily basis chiefly in the motor accompaniment of language; but the actual concrete feeling, "*I ought*," constitutes a sentiment of obligation, or of *being bound*, in part, just because it is the feeling of the motor impulse to inhibit or to innervate the muscular apparatus necessary to some action to which the feeling has reference. I feel "I *must not* speak," "I *must not* strike," "I *must not* go," or the opposite—and all this is, undoubtedly, ordinarily warmed up in consciousness by the appropriate secondary bodily resonances.

The various special forms of feeling which are customarily classified as ethical sentiments, might be examined in detail from the same general point of view. The affection of love in the complex form in which it develops between parent and offspring, illustrates well an entire class of sentiments. Such sentiment is originally produced, and nurtured in all its earlier stages, in obvious dependence upon, and connection with, numerous bodily influences. It is scarcely necessary to say that this is so in the case of the sentimental affection which exists, where the emotional or passionate stages are wanting, between persons of different sex.

It is the case of the higher intellectual feelings which seems to offer the most nearly perfect exemption from all traces of bodily resonance. That these feelings, however, are capable of assuming the character of disturbing emotions, or more slowly and yet intensely burning passions, we have already

seen to be true. The general argument, as derived from the very nature of the life of feeling and from the laws of its development, applies, therefore, to them also. A careful attention to the coloring of our consciousness when these feelings predominate helps, though perhaps only in an imperfect way, to illustrate the principle. Certainly the feeling with which I confidently draw a conclusion differs from that which forms the affective accompaniment of a flash of insight. And both these sentiments differ from that which marks the dubitating or doubtfully accomplished process of inference. Almost as certainly, a part of these differences is of the nature of a felt bodily reaction. The firm mouth and decisive gesturing, the start of surprise or the exclamation of joy at discovery, the drooping or shaking of the head, etc., which sometimes actually express such forms of intellectual feeling, respectively, are not without great significance.

Without directly returning to this somatic aspect of even the most ideal and spiritual of the sentiments, we shall find the correct view suggested constantly as we continue the treatment of them in detail.

The more properly Intellectual Sentiments may be, somewhat roughly, divided into two general classes. These are either (1) such as serve to give impulse and guidance to the intellectual processes; or (2) such as seem simply to accompany these processes without acting upon them in a marked way either to excite or to inhibit them. Yet some of the latter of these two classes also are probably not without a certain practical benefit in the logical processes which they accompany. The developed sentiment of "intellectual curiosity;" the semi-ethical estimate, as somewhat of great worth in itself, which comes to be attached in certain minds to the truth as such (the "feeling of the value of truth"—for its own sake); the feelings of affection and loyalty to science in general, or to their particular department of scientific research, which many devotees evince; the sentiment of "acquisitiveness" as directed toward stores of knowledge, and the pleasant feeling of attainment and possession that accompany knowledge; the feeling of certainty or "conviction," without which there would seem to be insufficient ground for the distinction between what is merely *formally correct* and what is, as we say, *really true*—all these may be mentioned as intellectual sentiments belonging to the first class. These sentiments are of very different degrees of complexity; they develop at different stages in the general advance of intellectual life; and they have not all, by any means, the same fundamental character and value as affective accompaniments of intellectual growth. For example, a purely sentimental feeling toward a fictitious creature of imagination called "science," or a secretive and miser-like eagerness to acquire and hoard facts, are affective phenomena which, although implying an extremely

complex ideational and logical development, are almost pathological in character. On the contrary, intellectual curiosity, and that feeling of conviction which attaches itself to the perceptive and ratiocinative products of intellect, are rather of the nature of universal human sentiments. While a high estimate of the value of truth, as such and for its own sake, may properly be held to mark an exalted standard of attainment in ethical, even more surely than in merely intellectual, development.

It would be quite impossible to enumerate, with confidence that no omissions were being made, the intellectual sentiments of the second class. Indeed, the rather might we claim that probably every new shade of discriminable logical processes has its corresponding shade of feeling accompanying and specially belonging to it. Here we go back again, as it were, to first principles in the development of mental life. We have seen that discriminating consciousness belongs to all consciousness, so far as consciousness contains data for knowledge of its own processes; and that, therefore, the most primary intellection is relating faculty. But all activity of relating faculty, we have also seen, has its accompaniment of feelings of relation. Personifying, and speaking in a figurative way, it may be said that the mind feels itself as it conducts all the logical processes. This is true of even the simplest processes of recognizing similarities, contrasts, etc.; as well as of those coupling and uncoupling processes which go on, in the most primitive forms of affirmation and negation, between the ideas. *All the processes of perception, memory, imagination, and thinking, therefore, have their peculiar affective accompaniments;* for feeling, in an all-around and pervasive way, is no less variable and fertile in productivity of various species, than is intellect, in the widest meaning of the latter term.

The feelings which characterize the intellectual processes, like all other forms of feeling, have their tone of either pleasure or pain. From this point of view, they may be divided into pleasant and painful intellectual sentiments. However, when this tone becomes obtrusive, its very existence detracts from the sentimental character of the feeling. For example, the struggle to accomplish an act of recognitive memory, or to find a middle term in an argument, or to recognize a relation, or to understand a principle, may become predominatingly painful. Suspense or confusion of memory, and of the processes of reasoning, may be felt as a painful emotion. But even where the feeling of the logical activities does not reach this emotional stage, it still has its mildly unpleasant or pleasant tone. Such tone may

often be regarded as approbating or disapproving, furthering or checking and inhibiting, the intellectual processes. When "one feels" dissatisfied with the correctness or completeness of an act of voluntary and recognitive memory, "one knows" that one has not remembered correctly and completely; and this dissatisfaction is itself a sort of craving further to correct and complete the act of memory. Thus, also, there accompanies our clearly conscious logical processes a feeling of their conclusiveness or inconclusiveness, which either makes us rest satisfied in the conclusion or desire to revise it. Indeed, to sophisticate that feeling, or to disregard it, is closely akin to the moral fault of lying. *For the whole mind's vital seizure of a truth as proved, as following rightfully from grounds, is in part a matter of pleasant sentiment.* In general, we can quote approvingly the writer[1] who declares: "A man without any feeling would certainly have no intellect as well." "And in a sound nature doubt, as a rule, appears at the right time, *i.e.*, always when the ground for it exists, and never without ground. This depends on susceptibility for the feeling of actuality and the feeling of truth."

§ 2. The refined sentiment of curiosity, as we have already seen, has its origin in a certain almost animal restlessness and tendency to satisfy craving with activity. This original feeling develops, however, into something much more complex and intellectually nobler. Such is the *desire of knowledge*, either—as we are wont to say—for its own sake, or for the sake of the many immediate and collateral benefits which belong to knowledge. In order to this, a growing experience with knowledge is, as it were, essential. To produce this sentimental feeling toward knowledge, it is therefore necessary that one should know what it is to know—that is, should reflect upon the accompaniments and results of knowledge, as such. Now, such experience is gained and such reflection stimulated, to a certain extent, for everyone in a perfectly natural and necessary way. But the more direct pleasures of knowledge are twofold—the pleasures of search and the pleasures of attainment and possession. That restless activity of all the powers, to which references have repeatedly been made, is itself capable of being felt in the process in a more or less pleasurable way. To this pleasure of activity is added the pleasure of satisfaction which follows the successful use of all the powers; the latter is a sort of affective "well-done, thou good and faithful servant," pronounced upon the self, and blended with the pleasant feeling of being discharged from obligation and eased of the demand for work. About this nucleus also clusters the memory of the joys of discovery and of experiencing the dawning upon the intellectual horizon of strange and novel facts and truths.

The experience of the more indirect benefits of knowledge complicates and strengthens further the same sentiment. Among such benefits are the

[1] Hartsen: Grundzüge d. Psychologie, pp. 19 f., 170 f.

influence and power which are associated with knowledge. To tell what *we* know, but is unknown by others, or even to think of ourselves as holding truth in possession which we can communicate at any time, begets pleasant feeling. To this may be added the benevolent desire to do good with our knowledge, either in a limited way to a few individuals or to the entire race as a contributor to its beneficent and growing stock of knowledge.

In connection with this complex accretion or development of feeling as the affective accompaniment of knowledge, the conception of knowledge itself expands, becomes more general and more abstract. By knowledge one comes to understand something "universal," something grand and inconceivably vast in extent, of which one's own actual knowing processes are only a poor and very partial representative. Even the most intense and narrow specialist finds quite impracticable the task of making his own the entire realm of knowledge that belongs to his chosen specialty. But other equally incommensurable specialties are known by him to exist. And beyond the aggregate of them all—the total sum of acquired human knowledge—lie the imagined immensities of space, as it were, to be yet explored and brought within ken, and then—the greater more, yet beyond. Thus do imagination and thinking succeed in refining the conception of knowledge so that it may, as an object of sentiment, absorb the devotion of those who worship their own conception. What a mingling of manifold sentiments is thus represented by the so-called "pure" desire or love of knowledge.

§ 3. The desire of knowledge, and the love of it, need but little further work of imagination to develop a mixed and rather morbid form of sentiment somewhat characteristic of modern times. Let us suppose the personification of an admirable system of generalizations to become more complete. We have now framed a conception (really of an exceedingly vague and abstract order) which appears worthy of the passionate devotion of any intellect that has no feeling for concrete personal interests—for the actual fears, loves, hopes, and faiths of humanity—but only for its own most perfect work. This abstract conception, thus clothed with flesh and blood and made into a lovely and attractive mistress, shall be called "Science;" and over opposite to it stands its worshipping devotee (Empedocles)—"A living man no more; Nothing but a devouring flame of thought, but a naked, eternally restless mind!" Perhaps fortunately, however, the intense and somewhat sordid interest of the age in the merely practical benefits of scientific inquiry counteracts largely this overwrought sentiment.

§ 4. The intellectual sentiments depend upon imagination for the construction of their *ideals*. Although, therefore, we speak of them as intellectual or logical, they are none the less æsthetical in character. Essentially considered, the feeling of desire for scientific achievement, of admiration for such achievement, of love and devotion toward it, are akin to those which are felt by the artist and the lover of art. With a somewhat different shading of the various forms of feeling which fuse in the complex state, the resulting sentiment becomes quasi-moral in its character. If what is known, whether by perception or self-consciousness or inference, is thrown into the form of a proposition, this proposition is called a *truth*. About the conception which answers to this word ("truth") there develops a com-

plex form of sentiment, which includes the feeling of "worth," or "value." This feeling of worth is itself one that has been framed in a very subtle way as the result of manifold experiences; it is very different in the case of different minds; and in many minds it never reaches more than a low stage of development. Yet the environment, and the natural reaction of feeling upon environment, enforces in mankind generally some "sentiment of the worth of truth." No individual—much more no community—can exist and develop long without some such sentiment. In the very highest form of its development, this feeling joins with the feelings of refined wonder, admiration, and love, to constitute an affectional attitude of mind toward what, as the result of much correlative work of imagination and thinking, we are pleased to call "*the* truth." This attitude of mind is, then, a sort of supremely complex intellectual, æsthetical, and ethical sentiment. It furnishes impulse and guidance to the noblest and choicest minds. It is so connected with their precious and undying faith that, as says Lotze,[1] "it must be even as we were taught by the feeling that animated our dreams—it must be that that which is worthy is that which truly is."

§ 5. Among those more complex forms of the intellectual feelings of relation which serve as guides, in some measure, to the logical processes themselves, stands the so-called "feeling of fitness."[2] This term, like several others we have just been using, applies to sentiments that have an æsthetical and moral, as well as more purely intellectual, aspect. As the life of knowledge develops, its very development largely consists in an increasing solidarity to all the tendencies, to all the expectancies, to all the actual forms of mental procedure. Every new perception, that is to say, depends—as respects the speed with which it is accomplished, the complex character it bears as a perception, the kind of feelings which accompany it, and the motor activities it calls forth—upon the entire acquired character of the mind. In a word, every man must say of himself: "I perceive *what* I perceive, etc., because it is *I* that perceive it." Of course, this same thing is even much more obviously true of all that is remembered, imagined, and thought. In general, each new object is presented to consciousness under the principles of the continuity and relativity of all mental life. Each new object is a challenge to the mind: "Look at me in the light of past experience and decide: Do I *fit* that past experience?" In fact, any theory of knowledge shows that we can never get behind the fact of knowledge itself; there is, in the last contest of truth with error, no test but the *fitness* or *unfitness* of each object or proposition with the sum-total of experience.

But the fitness or unfitness of any new experience is a matter that always arouses feeling. The mind cannot work as a pure, "cold, logical engine." As a matter of fact, moreover, *it is probably feeling, far more and far oftener than any reality or even any suspicion of strict logical conclusiveness, that settles for the time being what the truth shall be held to be.* If one *feels* that it is all right when one sees (has sensations interpretable as) a white-sheeted form standing in one's room on waking suddenly at midnight, then one does not inquire how it is fitting that one should perceive (actually interpret) that form. If one *feels* the shock of something unharmonious with one's system of moral and religious convictions, on listening to a certain

[1] Microcosmus, II., p. 311.

[2] Comp. Baldwin: Feeling and Will, p. 262 f.

proposition, then one instantly rejects or cautiously considers the shocking proposition.

Further analysis of the affective attitude of mind toward the character of its own intellectual processes would show that this attitude may involve contributions from nearly or quite all of those simpler feelings of relation to which reference was formerly made (p. 186 f.). Thus the complex sentiment of fitness implies the fusion or struggle of feelings of surprise, expectation, recognition (with feelings of similarity and difference), etc. With these elements, more or less intense feelings of anger, hatred, fear, love, admiration, and other quasi-æsthetical and ethical emotions may be mingled. The entire complex of feeling may then be spoken of as "the way the man *takes*" any particular proposition; or the "way in which it *finds* him." Practically, the affective attitude thus determines very largely what every man actually comes to accept for false or for true. Particularly is this apt to be so in matters of æsthetics, ethics, and religion, where feelings of fitness or unfitness are at once most subtle and complex, and also most influential and least subject to influence from ratiocination.

As compared with the forms of feeling we have just been examining, the Æsthetical Sentiments are, at once, both more sensuous and more objective. It is the blending of the two sets of characteristics denoted by these words (sensuous and objective) which enables us to describe these sentiments as peculiar affective conditions of consciousness. Whenever we are caught and held, as it were, in a contemplative attitude of mind before certain objects, we experience a unique form of agreeable feeling which may be called "the feeling of the beautiful." Its contrasted, or opposite, form of sentiment is evoked in "the feeling of the ugly" (or æsthetically unpleasing). Four things will, in general, be noted as true with respect to the origin and nature of the æsthetical sentiments considered as actual and concrete states of consciousness in the individual. It is only "as such," that psychology considers these sentiments; or even raises any of the various problems connected with the understanding and practice of the various arts, or of the real nature of beautiful objects. The consideration of such problems, and even their very definition as problems, belongs to the philosophy of æsthetics. Of æsthetical consciousness, as such, the following is in general true: (1) The object which excites the feeling of the beautiful is always some construction implying a refined and developed activity of imagination. This object may indeed be an object of perception; as in all cases where the sentiment is evoked by some natural thing, by beautiful scenery, by a picture or other work of art, or by some heroic or benevolent deed of which we are witnesses. Or, again, it may be some product of the constructive image-making faculty; as where one admires one's own castle-in-the-air, or

ideal landscape, or ideal hero. But in both classes of cases, imagination is the dominating intellectual activity, whose appropriate accompanying sentiment is the feeling of the beautiful. This fact both warrants and explains the statements that, on the one hand, the artist is characterized by the quality and amount of his imagination; and that, on the other hand, no person lacking in imagination can æsthetically appreciate an artistic composition. In brief, even where I *perceive* immediately the beautiful in nature, or in art, or in conduct, it is only as I, by activity of imagination, *construct* the object which I thus perceive. Nevertheless, (2) the contemplative attitude of mind before the object is characteristic of æsthetical consciousness. This attitude is distinguished in important particulars from both the practical and the discursive. For example, when I regard any presentation of sense, or work of my own memory or imagination, as answering the question, What am I to do with it? I may be said to maintain toward the object a practical attitude. In this attitude I see that the street-car, which I wish to take, is coming around the corner of the street; or I hear the clatter of its bell behind me. But if any object chiefly reminds me of some truth, or illustrates some principle, or suggests a train of reasoning, I may be said to regard it in a discursive attitude of mind. Neither of these attitudes, however, is primarily conducive to æsthetical consciousness; but just the contrary. If I take either of these attitudes toward any object, I have to return to the contemplative attitude before I can regard the object as beautiful or ugly. Only in this contemplative attitude can I be caught, so to speak, on the side of æsthetical sentiment; only thus can I consider its challenge: Am I, or am I not to you something beautiful?

(3) The feeling of the beautiful (or its opposite) is indeed an agreeable (or disagreeable) form of feeling; but it does not seem to be (at least, in all its more complex and highly developed forms) simply the feeling of the agreeable (or of the disagreeable). On the contrary, so soon as we begin merely to consider the agreeableness of the object—that is, its power to produce in us pleasant feelings—or turn our attention upon our own agreeable state of consciousness, our strictly æsthetical consciousness becomes modified. We may now judge the object to be agreeable to us, and may argue that it should be agreeable to others; but this is not the same thing as having the feeling of the beautiful in contemplation of the object. For this and other reasons we come to hold, with respect to æsthetical consciousness, that (4) it is dependent, for its highest development, upon

the idealizing tendency, and upon the power to form "ideals." This tendency is itself, in a measure, the expression of a sort of craving after that which transcends the limits of actual experience: it bears witness, in its higher manifestations, to the insatiable thirst for what is perfect, the aspiration after the more beyond, as it were. This power is only the expression of the fact that imagination and thought, with respect to the products which result from their combined activity, never cease to grow, never reach any recognized barriers beyond which the possibility of pushing their work forward is not, at least, conceivable. *Thus the highest, richest, and purest activity of intellection (which is not mainly the drawing of conclusions but rather the construction of ideals) has for its affective accompaniment the highest, richest, and purest of the sentiments*—a remark which is true of the psychical processes connected with the ethical as well as the æsthetical ideals.

§ 6. It is difficult, or impossible, to draw a line just where the sensuously agreeable passes over into the æsthetically pleasing. But on the intellectual side of this new kind of consciousness, which is characterized by genuine æsthetical sentiment, there can be no doubt of the important work done by the constructive imagination. Development of imagination is necessary to sentiment of the beautiful; the higher and more refined the activity of imagination, the more purely æsthetical does the side of feeling become. Therefore it has been held by some writers that, even in the case of all perception of beautiful objects, (1) the pleasure attaches itself to the form and not to the material of sensation; (2) the object must be recognized by the mind as implying relations; (3) there must be some series, or composite, of agreeable objects.[1] Now, it is by activity of imagination alone that "form" is imparted to, or recognized in, the sensuous materials; and it is imagination and thinking that give the recognized "serial" and "composite" character which the beautiful object has. For example, while a single tone sounded by a pure voice might be sensuously agreeable, an *aria* or harmony (a series or composite of tones) would be necessary to arouse æsthetical feeling. So, also, might any single color to a healthy eye, if presented in moderate intensity, be sensuously agreeable; but only arrangements of colors could be in good or bad æsthetical taste.

Such statements as the foregoing must be accepted as emphasizing an important truth concerning the nature of æsthetical consciousness. On the other hand, the case of the æsthetical sentiments is like that of every other complex development in the life and growth of human feeling. We can never lay our finger on the precise spot where the new manifestation of faculty, resulting from fusion of simpler elements, first begins to be in accordance with the laws of the mind's life. For example, no musical clang is heard as a poor and thin simple tone; it is itself a harmony of fundamental tones and over-tones, although the consciousness cannot analyze it (see

[1] Compare, for example, Mich: Grundriss d. Seelenlebens, p. 68 f.

p. 103 f.); and, besides, it appears in the stream of consciousness as one of a series of sounds—a sweet something emerging in relation to things either less sweet or positively harsh. Thus there is probably awakened in the infant's mind a genuine but only crude and inchoate æsthetical consciousness by croning tunes over it in rhythmic fashion, or by rhythmically swaying it back and forth. What is true of æsthetically pleasing perceptions of hearing is even more true of the similar perceptions of sight.

It is largely because sensations of smell, of taste, and of the skin, do not lend themselves readily as raw "stuff" for imagination to use in creating harmonious series and composite objects, that little or no æsthetical sentiment attaches itself directly to them. No wonder, then, that it is vulgar to speak of odors, savors, and agreeable sensations of the skin, as "beautiful." It is chiefly, if not wholly, in an indirect way—that is, by association with beautiful visible objects—that odorous, gustable, and tangible things are called beautiful. In this way, however, certain odors and flavors may attain a considerable degree of æsthetical value. Indeed, when thus sublimated and associated by the work of ideation, there is something about the intrinsic character of delicate odors which feeds the sentiments in a marvellous way. How powerful they are as factors in association we have already seen (p. 257). Nor are there lacking persons so constituted that Paradise, and its opposite, could scarcely be more forcibly represented in any other way than as places impregnated with agreeable or disagreeable smells. Others would sympathize with that traveller in the Pyrenees who, on drinking cool, fresh milk there, "experienced a series of feelings which the word *agreeable* is insufficient to designate."[1] "Even the feelings of the lower senses," says Professor James, "may have this secondary escort, due to the arousing of associational trains which reverberate." But such experience shows that the work of imagination is ever the main intellective support of truly æsthetical sentiment.

It is not necessary to exhibit the truth in detail for all the more complex and higher forms of æsthetical feeling. The theory of poetry and the practices of the poets, as well as common experience with poetry in the attempt to appreciate and enjoy it, show the supreme need of activity of imagination. And this is true of every other form of art. Indeed, from the purely psychological point of view, we seem justified in saying that beautiful objects do not exist, *as beautiful*, for anyone who cannot or does not actually construct them by an act of imagination.

§ 7. This so "contemplative" attitude, which we find ourselves obliged to take toward objects that excite the feeling of the beautiful, is one of the most interesting and marvellous of psychological phenomena. In its initiation it resembles the state of consciousness described as surprise or wonder. But it is soon found to be something far more complex than either surprise or wonder. It is not, however, by any means the attitude of merely intellectual curiosity or interest. In fact, so far as these intellectual qualifications are prominent, the æsthetical character of the state is diminished or lost. Various experiences, otherwise commonplace, are significant of this: (1) We find that we must have time in order to develop genuine æs-

[1] M. Guyau, as quoted (by Paulhan from Les Problèmes de l'Aesthétique contemporaine) by James: The Principles of Psychology, II., p. 469.

thetical sentiment. One can be hurried, or snatched away violently, into a state of sensuous pleasure or pain; but the feeling of the beautiful, or its opposite, develops relatively slowly. Connected with this is (2) the fact that, as Sully has said,[1] æsthetical feelings are expansive or susceptible of prolongation. It is true that when they are highly emotional, or are accompanied with considerable excitement through the effort of the mind to keep a rapid pace in its analysis and appreciation of novelties, they may become wearisome and exhausting. But in their delicate, sentimental form they imply that more passive and yet intelligent attitude before the object, which is sometimes called "intuition." This attitude has the accompaniment of a slowly spreading and prolonged pleasurable sentiment. For (3) while analysis of the object may be involved in the arousing and cultivation of æsthetical sentiment, just so far as such analysis is made with enough effort to attract attention to itself, it detracts from the possibility of æsthetical enjoyment. This fact Schopenhauer emphasized in exaggerated fashion, as follows: "Pure contemplation, sinking one's self in perception, losing one's self in the object, forgetting all individuality, surrendering that kind of knowledge which follows the principle of sufficient reason, and comprehends only relations." Hence (4) arise the bodily attitudes which men naturally assume when they are in the act of contemplating beautiful visual objects, or are hearing fine music; hence also the intolerable irritation which comes from unfitting sensuous interruptions (trivial conversation, laughter, platitudes of the "guide," beating time at a concert with a fan or with the foot, etc.), or even from the proposal to argue the case. In the same way (5) must we account for the fact that explanation and argument are not directly productive of æsthetical feeling. I may feign the sentiment of the beautiful, because I think it the appropriate thing to have this sentiment; and to a certain extent, undoubtedly, the sentiment springs up and thrives as a social and sympathetic feeling. But in its genuine form it exists only as these preparations and excitements lead to the right contemplative attitude before the beautiful object.

§ 8. The statement that æsthetical feeling, whether agreeable or disagreeable, is not *merely* the feeling of the agreeable or disagreeable, does not conflict with the previous statement that all the sentiments involve elements due to the character of the bodily reactions. *Sensuous* pleasures are afforded by nature and by every form of art. Since it is with the eye or the ear that the principal classes of beautiful objects are intuited, the laws of the pleasurable activity of these organs must be regarded in awakening the sentiment of the beautiful. Hence a possible science called "physiological æsthetics." For example, a work of architecture, in order to awaken æsthetical enjoyment, must not have its main lines swept in directions unnatural and painful to the moving eye;—such as from lower right-hand, to upper left-hand, corner, or the reverse. Moreover, optical illusions—like that which makes a straight window-sash, when set in a bowed front, appear crushed in—must be avoided. Indirect associational results, such as the feeling of insecurity which is produced by seemingly insufficient support to any part of the structure, are especially powerful.

On the other hand, it is the testimony of all the most intelligent lovers

[1] The Human Mind, II., p. 187.

of the beautiful, that the "pleasure-pain" qualifications of æsthetical sentiment are not the whole of their affective experience. The rather is there something about this kind of feeling which fits it to be the accompaniment of a universalizing and idealizing activity of the mind. Its non-sensuous character is the important thing about it. As we have already said, consideration of one's own state as agreeable, or of the utility of the object as capable of producing that state, detracts from the æsthetical purity of the sentiment. Connected with this is the significant natural feeling—the beautiful object *ought to be* admired; and that, by everybody. Hence, while men deem it absurd to dispute about lower forms of "taste" which concern only what is sensuously agreeable or disagreeable, they dispute most earnestly (however vainly) about "taste" in matters of the beautiful and the ugly. To genuinely æsthetical matters the motto *De gustibus non disputandum*, distinctly does *not* apply.

§ 9. The dependence of æsthetical feeling upon the tendencies of human nature to construct ideals, and upon the developing faculty of constructing ideals, accounts for many of its peculiarities. Herein is found the chief cause of man's æsthetical superiority to the other animals. Comparative psychology, indeed, leaves us, even more than upon most important matters, almost completely in the dark as to the real nature of the so-called "æsthetical consciousness" of the lower animals. So far as can be discovered, however, the lower animals have no genuinely *æsthetical* feeling.[1] Those manifestations which are sometimes interpreted as signs of such feeling appear rather to result from either unconscious and merely *organic* impulse, or from selective *sensuous* excitement of a pleasurable or painful kind. In almost, if not quite, all stages of human development, however, the adult human being does exhibit plain signs of a genuine æsthetical feeling. The theory of evolution, to be sure, correctly points out that in its lower stages æsthetical sentiment is largely mixed with feelings of pride, of self-esteem, with love of being made an object of admiration or of fear; and with other special forms of emotion. But "primitive man" even—so far as we know anything whatever about him, apparently had also an unanimal and genuinely æsthetical consciousness. In food, drink, clothing, and sexual intercourse, the human animal tends to be ceremonial and, at least, rudely artistic; and this he does with some consciousness of the ideal worth belonging to "the form" in which things present themselves, or are done. The picture of man pleasing himself with the rude musical instrument, or the twang of his bowstring, or patiently adorning his weapons and utensils without obvious thought of anything beyond his satisfaction in the object thus shaped, is just as old and authentic as any picture of man that evolution can exhibit.

But this distinctively *human* feeling is plainly, in large measure, due to the high and unapproachable degree of activity which imagination and the power of abstraction have attained in man. And the same consideration shows us why the æsthetical sentiments vary so greatly in different ages, stages of general culture, and in different individuals. In no respect do races and individuals differ more than in respect of the precise form which they give to their ideals. Indeed, "precise" and permanent form is incon-

[1] Comp. Parker, The Spirit of Beauty, for a brief discussion, both scientific and æsthetical, of this question.

sistent with the very nature of an ideal. Hence the race and the individual are found admiring at one time what they pronounce far from admirable at another time; hence, too, they are scarcely to be permanently satisfied with any real object. For the limits of imagination and abstraction can never be regarded as fixed.

§ 10. The influence of association in the production of æsthetical sentiment requires no special detailed psychological treatment; for this influence falls under the same principles as those which have already been sufficiently expounded. It should be noted, however, that the place where association begins, and the exact amount of it, cannot easily be ascertained. For example, even in experimenting with simple geometrical forms, or with combinations of colors, or by sounding two or three notes in succession and with some variety of intervals, the distinction between what is "naturally" most pleasing æsthetically, and what is so "on account of association," can seldom be made with perfect confidence. In general, however, the element of association is least prominent in music and in its æsthetical enjoyment; the reason for this is obvious: musical sounds, of all forms of artistic impression, embody most of pure feeling, and least of ideation and thought.

It belongs to æsthetics rather than to psychology to show that all the more complex beautiful objects arouse the higher forms of æsthetical sentiment, in their contemplation, because they are associated with some ideal already formed in conscious life. This is as true of the beautiful in nature as it is of the beautiful in art. For this reason the æsthetical appreciation of nature has been developed in association with the religious feeling. In many cases the two are indistinguishably blended. The more independent development of sentiment toward the beautiful in nature, as such, is largely a modern affair. It is a mistake, however, to say that "the feeling for nature's wild solitudes is hardly older than Rousseau."[1] The Japanese, at any rate, have exhibited it for centuries in their principal characters and works of art. Nor do we believe it correct to say, that the ancients wholly lacked it. Yet even in its so-called independent modern form it is semi-religious, as it were. "We view nature's scenes and movements as products, and admire the creative and expressive spirit behind," whenever we contemplate nature in the æsthetical attitude.

The recognized Kinds of the Beautiful, and the psychological theory of the arts which produce beautiful objects, depend upon the possible variations in æsthetical psychoses. And these variations of consciousness depend upon the combinations of the sensuous, the ideal, and the affective elements which enter into consciousness. Here, as in all the phenomena of the life of feeling, satisfactory classification is difficult or impossible. As respects sensuous data, the two main classes of beautiful objects are, objects beautiful to sight and objects beautiful to hearing. The subdivisions of the former depend upon the kind of material presented to the eye, or upon the purpose which determines its

[1] So Sully, The Human Mind, II., p. 144.

form of arrangement. Natural scenery, landscape-gardening, architecture, sculpture, and painting belong to this class of beautiful objects. But to the second class belong music and poetry. These all, however, differ in respect of the kind and amount of æsthetical feeling which they induce; and this, not only by the character of their sensuous elements, but also by the kind and amount of associated ideas which they express. On the one hand, we find a warmth of sentiment awakened by painting which architecture and sculpture cannot arouse; on the other, we find a wealth of intelligent and more definite sentiment stirred by poetry which music, with its unparalleled power to sweep the soul along in the currents of pure but indefinite feeling, cannot possibly attain.

In dependence upon such variable sensuous and ideal factors, the different main kinds of æsthetical sentiment are developed. These, however, may almost be said to shade into each other, as the point of view changes from which any beautiful object is regarded. At two apparent extremes stand, for example, the feeling of the sublime and the æsthetical appreciation of the pretty, of the *petite*, etc.; or yet again, the joyous sympathetic sentiment with which we greet the free luxury of wild nature, and the more subdued approbation accorded to what is most obviously neat, orderly, and conformable to recognized law. Here we note—in illustration of recognized psychological principles—the heightening of æsthetical pleasure which comes from the feelings of relief, novelty, change, etc., when we pass from one of these extremes of æsthetical consciousness to the other, as it were. Thus the delicate beauty of the petals of a flower, or of an insect's wing, may be the more enjoyed in contrast with the feeling of sublimity produced by sight of the stormy sea; or the sight of a beautiful human figure in the "abandon" of unthinking freedom may be the more grateful after admiring the precise working of some well-constructed piece of mechanism in metal.

§ 11. It is plain that the words "beautiful" and "ugly" have just been used with a more vague and extended significance than is ordinary. This, however, seems necessary. By the phrase "feeling of the beautiful," or agreeable æsthetical sentiment, and by the adjective "beautiful" as applied to such a great variety of objects with different and even conflicting characteristics, we intend to express precisely that which is common to an entire class of unique experiences, and therefore cannot be otherwise described. For example, I contemplate the starry heavens or an heroic deed of self-sacrifice done in obedience to duty, and I call both "grand" or "sublime." Then I see a tiny flower or a pattern wrought on a cloisonné vase, or a

nicely executed courtesy, and declare each of these to be "pretty." Or I watch a yacht in full sail, or a gayly dancing child, or listen to a *scherzo* or a waltz of a musical master, and exclaim: How "charming!" These three kinds of experience are undoubtedly widely different states of consciousness; just as the objects are very unlike, which evoke them. Yet such psychoses are all æsthetical sentiments, and the objects are all beautiful. This is *because they all belong to the class of those unique, complex, and agreeable feelings which arise on contemplation of any concrete representation of an ideal form of life.*

Psychological analysis discloses the more important of those fusions of the simpler forms of feeling which result in the principal types of æsthetical consciousness. For example, we have already seen that the sentiment of sublimity includes a certain modification of sensuous feeling connected with the large and expansive use of the bodily organs in contemplation of an object. It is also characteristic of this sentiment that, in it, attention is not definitely fixed; the processes of ideation and thought are vague and result in no definite image or conclusion; and the suggestions and associations are of a mysterious, unknown more beyond, of the unlimited, as it were. All this is true of both the "dynamical sublime" and the "mathematical sublime" (to refer to Kant's distinction); it is also true whether the "dynamical sublime" is presented in the form of physical, or of intellectual, or of moral, power. Hence that admixture of fear, or of awe, which has always been recognized as entering into this sentiment. Hence also the conflicting sense of the admirable greatness of *some* power, and of the littleness of *our own* power—by accentuation of either of which a tinge of more or less of the pleasurable or painful is given to the sentiment.

On the other hand, in experiencing the sentiment of the pretty or the *petite*, the bodily reactions are far less massive and swelling, as it were; attention is concentrated upon a certain harmony of relations confined within a small space; and the resulting feeling has perhaps a slight admixture of the pleasurable sense of superiority — not without respect, however, for what obeys law, if even on so small a scale and in so otherwise trivial particulars. Again, we call that graceful or charming, whose appreciated ease of movement and abundance of life leaves nothing to be desired in these directions, but the rather relieves us from the feeling, how difficult and painful a thing it often is even to live and to move at all.

Such indications as the foregoing are confessedly meagre; but we believe them to be based upon true psychological principles which may be applied to the understanding of the complex nature of the various forms of æsthetical consciousness. Out of this root might grow a safe psychological discussion of the principles which should govern all the arts; and of the general characteristics which all beautiful objects must possess. But these things are foreign to the purpose of a treatise on descriptive psychology.

Some reasonable doubt may be raised whether the Feeling of the Ludicrous, in the widest meaning of this term, properly belongs with the æsthetical sentiments. "Here, it is evident"—as says Sully—"we have to do with a feeling of a lower level." But although this is true of most kinds of laughter, and of the

objects and events which excite laughter, the developed feeling of the ludicrous is a very complex and truly human sentiment. The physiological origin of mere laughter is found in the overflowing effect of any strong emotional excitement. Actual laughter may occur as the expression of various forms of feeling. As, however, its excitement comes more under the influence of imagination and volition, the resulting forms of sentiment are exceedingly difficult of analysis.

There are, moreover, several forms of the feeling of the ludicrous which show the admixture, in varying degrees, of different allied feelings. Among such allied feelings are anger and hatred, scorn and despite, the proud feeling of superiority, selfish pleasure at seeing others degraded or shown to be inferior to ourselves, and even the seemingly antagonistic feelings of pity, grief, and sympathy. By such various forms of fusion arise those complex states of consciousness which answer the challenge to appreciate wit, sarcasm, satire, humor, and the like. As to what it is in certain objects or happenings which excites the various forms of the feeling of the ludicrous, there has been almost endless debate. It would seem evident that there must be in the objects some variety comparable to that of the sentiments with which the mind responds. Perhaps no other one characteristic fits so many cases as that which has been called "the incongruous." That is to say, in order to excite the feeling of the ludicrous, there must be perceived, concretely represented (and generally breaking in upon consciousness as an agreeable surprise), some incongruity—some setting at nought, by the object or event, of what might rationally be expected. If the exhibition of this result arouses strong feelings of pain, either directly, or indirectly by sympathy; then the latter overwhelm the feeling of the ludicrous. But if our feeling toward the object is one of anger, or of scorn, then pleasure may be awakened by the pain which the object of the sarcasm or satire endures.

§ 12. Of the several kinds of laughter only two or three demand attention here. Of these one of the simplest and most primitive is the laughter of play—sportive laughter. Such laughter, even with a certain "roguish" tinge, belongs to very young children. Preyer[1] observed it as early as the end of the second year. When the feeling of playfulness becomes refined and developed, it expresses itself in various artistic ways which may call out sympathetic sentiments in response. For example, there are certain *scherzos* of Beethoven which add the feeling of playfulness to their musical charm; or which, the rather, are the more charming because this feeling fuses with the other feelings which they awaken. The sentiment with which a culti-

[1] The Mind of the Child, p. 299. The Senses and the Will.

vated man watches the play of children, or of other young animals, is truly æsthetical. It probably has nothing to parallel it in the consciousness of the lower animals. The laughter of the savage as he triumphs over his enemy, and thrusts him through with his spear, is indicative of a crude form of the same emotion as that which, when intellectually (though not always ethically) refined, responds with the "biting" sarcasm or the "stinging" jest. But merriment over what we call "wit" has less of the so-called malevolent element in it; and the feeling of admiration or surprise at the intellectual display—the wit that is shown in this way—further modifies the feeling of the ludicrous. Although the distinction is not sanctioned by uniform usage, and (like all distinctions in this realm of conscious life) is not always to be made with perfect confidence, yet the sentiment called "humor" may be said to involve more or less of benevolent and kindly feeling. It is therefore the feeling of the ludicrous shaded in the opposite direction from that induced by sarcasm and satire. Its refinement and application to the wide realm of human experience is, in general, characteristic of a high degree of intellectual and moral development.

The Sentiments customarily called Ethical (or Moral) are of two classes; either, first, such as are in themselves distinctly unique and original forms of moral consciousness; or, second, such as, although not themselves—properly speaking—ethical in character, are the springs, or motives, of that conduct to which the distinctly ethical feelings attach themselves. The second of these classes of feeling includes the natural emotions of anger, fear, shame, curiosity; but especially of hatred, sympathy, and the various forms of the affection of love. All psychological discussion of the truly "moral feelings" should, then, begin with the forms belonging to the first class; they are indeed, as we have already said, the unique, and only distinctively *moral*, sentiments. They may be said to consist of two pairs of opposites. These are, (1) the feeling of obligation—the feeling for which we use such terms as "I ought," "he ought," "one ought," etc., or the opposite feeling, "I ought not," "he ought not," etc. Closely connected with and akin to this feeling of obligation, but not the same in its coloring and import, is, (2) the feeling of moral approbation, or its opposite, the feeling of moral disapprobation. This latter sentiment we express by saying my conscience "commends," or "condemns," me (or him) for having done so; or, in case the feeling rises to a sufficient height of energy, we may experience a sort of exulting over one class of deeds, and regret, or remorse, or indignation, or repulsion, over another class of deeds.

For the actual origin in consciousness of these sentiments, we note the following conditions as necessary: (1) The feeling of obligation arises only in view of some deed, or course of con-

duct, which is conceived as possible of either voluntary acceptance or rejection. *It is, in its very nature, a feeling of being obligated to do something, or not to do something;*—although "doing" may, in this case, include also choosing to do, or trying to do, as we are accustomed to say. If any form of perceiving, imagining, or thinking, is held up before us and we feel, I ought to perceive, imagine, or think in that way; it is always implied that such activity (of perceiving, imagining, or thinking) is possible as a deed of will. Hence (2) the development of intellect and will is necessarily involved in the very rise and growth of the moral sentiment of obligation. The development of intellect must, at least, have proceeded far enough to include the capacity of holding up in imagination the deed, or course of conduct, of anticipating an end to be realized thereby, and of concluding—however impulsively and illogically—as to results which will follow, *if* the will be thus and so. Such development of intellect is, in connection with the facts and laws of conation, equivalent to a development of will (this we shall make clear later on).

(3) The feeling of moral obligation is, therefore, necessarily correlated with judgment. But there is no peculiar class of psychoses to be denominated "moral judgments," as such. Judgment as to *what* I ought, or he ought, or one ought, under any given circumstances, is acquired under the same conditions as those which belong to the formation of all judgment. *There is therefore no special faculty of "conscience" as a matter of pronouncing judgments merely.* The whole complex of intellectual experience, and the whole trend of intellectual development determine what every individual will, in fact, judge to be "right" ("that which ought to be done"). In this interdependent development of intellect and feeling, within the sphere of conduct, the following relations are uniformly sustained: at first, environment, education, instruction, arouse the feeling of obligation in connection with certain forms of conduct. Consequences, observation of custom, explicit exhortation, and following reward or punishment, excite the sentiment of the "ought to," in view of some conduct, and of the "ought not to," in view of other conduct. Thus habits are formed and the moral sentiment determined in definite directions. But as intellectual development goes on, men have more varied experiences and—so we expressively say —"think more and more for themselves." And thus this sentiment comes to be held in suspense, or to fluctuate, or to form itself at last only doubtfully, as we question what *is* right, or wrong, under such and such circumstances. In these respects

the development of moral sentiment both rese
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But the same thing is not so true of Art.

(4) The sentiment of moral approbation or
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and growth force upon us certain standards to wh
reaction of feeling has become attached, without t
the standard being apparent or even attainable.

But, finally, (5) *the ethical sentiments are as origi
able of derivation from other forms of feeling as
higher and more complex processes of consciousness.*
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they arise in the individual, and why they have th
connection with each other, and with the develop

lect, which they actually have—these are questions which psychology cannot answer. Whether anthropology, or any other form of science, or philosophical speculation, can answer these questions, it does not belong to our purpose to inquire. As psychologists we can only recognize the fundamental psychical facts.

§ 13. The detailed description of the outfit which human nature develops with reference to right and wrong conduct, in the distinctively ethical meaning of these words, belongs to psychological ethics. The really distinctive features of this outfit are, however, very largely the very forms of sentiment which have just been described. In all other respects the so-called moral nature of man, psychologically considered, requires here no special treatment. Mention must be made, however, of one conception which derives its unique character from its connection with these distinctive forms of feeling; this is, of course, the conception of "the right." What, then, is the actual process in consciousness answering to this conception; and what is the characteristic development of experience out of which it has its rise? The answer to these questions requires mention of a distinction which has rightly been widely emphasized—the distinction, namely, between the "subjectively right" and the "objectively right." In the customary order of development the individual man's conception of the right is generalized from his presentative experience with those forms of conduct which have habitually been connected with the moral sentiments. In the case of morally well-bred children, the ethical consciousness arises and expands in something like the following way: The parent, or the nurse, or the teacher, deliberately and habitually connects with certain "doings" the arousement of the ought-feeling and the feeling of approbation; with certain other forms of conduct, in the same way, is connected the opposite forms of these ethical sentiments. With all persons, including those not thus well-bred, the social and even the physical environment tends to establish a similar connection. But this connection implies, in its very possibility, the beginning of a so-called "moral nature" for the child. All its pleasure-pains may thus come to have for it a quasi-moral import. On the basis of this experience with its own states of affective consciousness, considered as connected with deeds of its own will and voluntary courses of conduct, the intellect of the child generalizes. Here, however, as in the formation of all judgments, the greater part of the conclusions—such as this is right and that is wrong—are accepted as already formed from those older than itself. The "freeing" of the idea of the right from its concrete and sensuous clothing, as it were, results in the formation of a more and more abstract system of moral principles. Such are statements like the following: "Truth-telling is right and lying is wrong;" "honesty is right and stealing is wrong;" "kindness is right and cruelty is wrong," etc.

The further theoretical amplification, as it were, of the conceptions corresponding to the words "right" and "wrong" comes only when the effort is made to tell *why we thus judge*—on what grounds the affirmation, and its attachment of sentiments, reposes. Hence arises much debate as to what is right, what wrong—in the objective sense; that is to say, what conduct is adapted to realize, and what not to realize but to thwart, certain ends of

conduct which, as we say, "ought to be realized." But all this, of course, involves the further abstraction of our conceptions and their detachment from the more individual forms of experience. Yet even here, *if the word "ought" retains any semblance of a genuinely moral significance, it corresponds to the awakening of the same unique form of sentiment.* The sentiment itself is, however, found attaching itself more and more to some form of an ideal. And here we return again to the dependence of the ethical feelings upon imagination and intellect for their development. Here also we note once more, from another point of view, the difference between the æsthetical and the ethical sentiments; there are many kinds of the former, to respond to many kinds of the beautiful; but there is only one species of the ought-feeling—forever essentially the same for the child and the adult, for the savage and the man of culture. But, again, there is the greatest variety in the kinds of conduct which call forth this unique feeling; and this variety is largely due to the working of well-known principles of evolution.

§ 14. Whether evolution in the race can do anything whatever toward accounting for these unique moral sentiments is a doubtful matter. We do not believe that it can; we do not believe that it even makes any approach in the right direction toward rendering such a satisfactory account. But the question is, of course, a psychological question only so far as the development of the individual is concerned; and, psychologically considered, we have already spoken of the feeling of the ought as incomparable and unique. This we believe to be true in such a way as to make it impossible to regard the feeling as a result of evolution, in the case of the individual. Nor do we find any sure traces of distinctively moral feeling among the lower animals. The nearest analogue to it is doubtless the animal emotion of shame. The latter is closely akin to a mild form of fear, and the signs of the two are not infrequently confounded. It can scarcely be denied that some of the lower animals—as, for example, the dog especially—exhibit signs of shame after having done certain deeds, or having failed in certain endeavors. So does a defeated football team; or a school-boy returning with torn clothes from his half-holiday. But even if we admit that the consciousness of the canine retriever, which has failed to bring back his bird, or that of the poodle which has torn the forbidden cushion where he has been lying, exactly parallels human consciousness in similar circumstances, it does not follow that either animal or man is here experiencing a genuine moral sentiment. For shame is no more than are other natural emotions, of necessity, a moral feeling. *In order to become moral, the feeling must be converted into shame for having done what one consciously feels one ought not (in the ethical meaning of the word "ought") to have done.* Thus even moral shame only implies in an indirect way the ought-feeling; it is directly more like the feeling of moral disapprobation. But since *moral* disapprobation cannot exist without implying the ought-feeling; and since shame very frequently does not imply the ought-feeling, we may well doubt whether genuine moral sentiment of any kind can be said to develop out of the feeling of shame. And what is undoubted, from whatever point of view we regard the matter, is this: *whenever and however genuine moral sentiment arises in consciousness, its characteristics entitle it to be set apart as a class by itself, to be considered quite unique.*

The Division of the Ethical Feelings into "egoistic," or selfish, and "altruistic," or social, is not based upon distinctively ethical grounds. For, properly speaking, neither of these classes of the emotions is, as such, entitled to be called moral; moreover, the distinction is, psychologically, of doubtful value. And yet it is frequently proposed to test entire systems of morals by this somewhat inept distinction. Several of the emotions, which are ordinarily classed as egoistic, are also, as a rule, very powerfully altruistic; some of them are the very emotions on whose existence society is largely based and by which it is guarded and developed. On the other hand, the most clearly altruistic emotions, as such, may be given a decidedly egoistic turn—may even be most selfishly exercised and cultivated. Moreover, there is no emotion of either kind which may not be either exercised or inhibited under the influence of genuinely moral sentiments. Neither is there one, the experience of which, in respect of its intensity, occasion, object, etc., may not be the fitting subject of a genuine moral approbation or disapprobation. When, then, morality is spoken of as "essentially a social feeling," the statement may be correct, or only partially true, or quite erroneous, according to the interpretation given to it. And when feelings of kindness, sympathy, and various forms of affection, are demonstrated or assumed among the lower animals, no inference can be drawn as to their possession of genuine moral sentiment.

The ought-feeling and the feeling of moral approbation or disapprobation always, of course, have reference to something definite and concrete. As has already been said, it is some particular deed of will, or course of conduct, whose obligation is felt and for which the approving or disapproving sentiment is experienced. Such deed of will, or course of conduct, ordinarily concerns some other being than ourselves, who is, like ourselves, a moral and self-conscious or, at any rate, a sentient being. It may be possible to show that rational right conduct could not exist except under conditions of a social community; and that, indeed, the very words right and wrong have no rational meaning without implying consequences of conduct affecting the happiness, or other form of the well-being, of such community. But these conclusions are not to be derived directly from the very nature of ethical consciousness, as such; they belong, that is to say, to ethics as philosophy rather than to psychology. As a psychological fact one may just as fitly consider the ethical sentiments connected with one's getting angry when one has struck one's foot against a stone, or with indulging in inordinate

but unmanifested self-esteem, as the most obviously social feelings of sympathy and love for humanity. Nor does the important truth that the peculiar forms of excitement which ethical sentiment sustains, and the connected judgments as to what it is right to do, have resulted in the course of evolution from the approving and disapproving action of the social community, affect the statements already made.

Among the so-called egoistic and altruistic feelings, however, there are certain which are powerful adjuncts to the development of genuine moral sentiment. Such are the egoistic feelings of pride, fear of the evil opinion of others, and love of approbation, or desire to hear ourselves praised and to stand well in the sight of our fellows. Such, especially, are sympathy and all the different forms of love as dependent upon varying relations with all manner of other beings. Upon these feelings themselves—on condition that they, too, may be represented to the mind as deeds of will or species of conduct—we find ourselves pronouncing moral judgment. This is because these feelings are naturally, and by virtue of the very character of our moral training and moral development, so closely connected with the true moral sentiments—with the ought-feeling and the feeling of moral approbation or disapprobation. All education, whether administered by social environment or by individuals with a conscious purpose, appeals to pride, fear of opinion, desire of approbation, sympathy, and varied affection, for the arousing and culture of genuine *moral* feeling and *moral* conduct. Thus the conviction that one ought to feel in certain ways—both as respects self-feeling and also as respects feeling for others—becomes a part of the very life of affective consciousness.

§ 15. Even among the lower animals the distinction between egoistic and altruistic emotions is inexact and unethical. Fear, anger, hatred, pride, etc., are all often as truly altruistic as egoistic. No fiercer and more courageous exhibitions of anger and hatred can possibly be called out in wild beasts, and in many domestic animals, than those which are connected with the love and protection of their offspring. Very young children will often fly at one who seems to attack a parent or a nurse, even more promptly and vehemently than when the attack is made upon themselves. Nor is this true of the lower forms of these emotions alone. Who would venture to consider "egoistic" (in any defensible meaning of the term) the burning passion of the parent against one who has wrought the moral ruin of a child; or the philanthropist's hatred of the oppressors of the poor and friendless? The same thing is true of fear. Even jealousy and pride, which seem in their very nature to be most purely selfish, have their altruistic aspects and uses. The pride we take in the honors and successes of a relative or friend is far more closely allied to sympathy and love than it is to any form of self-interested

affection. And that the most intense jealousy is often born of affection, everyone knows. In general, those forms of "eudæmonism" which overlook this class of facts are, of all ethical theories, most unpsychological. In concrete fact, all men feel and think far less with direct reference to self than is ordinarily supposed. This is true of the morally bad even; because the most corrupted human nature is still *human*, and has the many-sided affectional outfit which belongs to man.

On the other hand, not only the earlier and undeveloped forms of so-called altruistic feeling, but also the apparently most refined and highly developed, are often, from the ethical point of view, thoroughly selfish. This is true of both the "ingredients of social feeling" which a recent writer[1] has distinguished; namely, "feeling of Attachment" and "feeling of Sympathy." The former is in many animals and young children a characteristic reaction on being fondled or caressed; and so, is as purely egoistic as the reaction of anger on being hurt or spurned. The attachment of the mother also is (as physicians are accustomed to notice the fact), in part, a characteristic reaction after the pains of childbirth have subsided. All forms of concrete and definite human attachment—as, for example, that of members of the same family, or tribe, that of lovers, that of friends, etc.—have their egoistic as well as their altruistic aspects. This remains true, no matter how diligently cultivated and highly refined they may become, through being suffused, as it were, with moral sentiment, and controlled in the light of moral judgment. For they are certainly mistaken who imply that the individual can ever free, from admixture of self-feeling and self-reference, any of the most altruistic sentiments.

§ 16. Undoubtedly sympathy, when developed in connection with the ought-feeling and with the faculty of judging as to consequences of conduct, comes most near to being a so-called "pure" social feeling. Undoubtedly also, it is the spring of a large part of that conduct which cultivated moral sentiment approbates, and which intelligent ethical theory discovers to be most productive of enlarged well-being. But sympathy, as truly as any of the most egoistic feelings, is in its beginning and early development an instinctive, emotive, and *non*-moral affair. In the case of the human offspring it is likely that, even before birth, the fœtus is so much a part of the maternal organism as to share in "the intra-organic sympathy or consensus."[2] A certain mutuality of interests, by way of likings and dislikings, fears, hopes, hatreds, and loves, is provided for in the very relation of parent and offspring. This "uterine" sympathy—like the mutual fondness which is one of its manifestations—is quickened and cultivated by the earlier relations of the family life. In every closely compacted family organization there are seen strong tendencies to develop common forms of emotional excitement. Indeed, so all-inclusive are these mixed altruistic and egoistic tendencies, and so deeply laid are the foundations of this instinctive sympathy that, probably, the anger and quarrelling between members of the same family operates, as a rule, rather to strengthen than to destroy them. *Indifference toward our fellow-men, and especially toward those among them most intimately connected with ourselves in a social way, is, psychologically considered, the most "inhuman" of all feelings.*

[1] Sully: The Human Mind, II., p. 108 f.
[2] Comp. Höffding, Outlines of Psychology, p. 247.

This crudest form of sympathy, like the most refined
extends to every kind of feeling which men have in comm
anger, dislike, or antipathy, is as natural and as truly
sympathy (indeed, in its way often as "moral") as is sym
or grief. It is the possibility of this which makes all forms
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Smith [1] remarks—resentment is not a fit subject for sympa
however, that the different kinds of sympathetic feeling d
with respect to the way in which they are realized; and th
extends to the ease and satisfaction with which we experie
the connection which it is possible to establish between the
and ethical sentiment. In all these respects, however, th
different races and different individuals show that infinite v
longs to the entire life of feeling. For example, a Japanes
theatre will display the most lively sympathy with the exhil
to his liege lord (the *daimyō*) on the part of a servant, no n
other unseemly and immoral emotions this sentiment of
mixed. But in the most refined circles of Western civilizati
to excite sympathy with a crying infant or an angry child.
many who have attained enough rational self-control not to f
truth of the observation of a modern story-writer: "It's pro
an object of pity balk!" While certain exhibitions of feeling
part of the slowly moving, "sputtering" kind, like fretfuln
envy, etc.—are peculiarly repulsive to sympathy. On the c
have a well-known contagious character; such as anger, fe
the feeling of the ludicrous. The account of this contagiou
be given by evolutionary science, in only a very partial wa
the development of feeling generally, about the last word whi
can utter is often equivalent to saying: Men behave in this wa
is their nature to."

§ 17. The development of sympathy into genuinely altruist
sentiment (ethical, by connection established between it an
feeling) is dependent upon the growth of intellectual life.
that it is an only half-intellectual principle of imitation whic
trols the earliest manifestations of sympathy. But with the gr
ination the ability is acquired to enter, ideationally, into the
others, and so consciously to "feel with" them in a highly com
With the growth of thought and the resulting power to di
quences, comes the ability to estimate the grounds on which th
others repose, and to bring them to standards such as are
estimating our own affective phenomena. Thus we find oursel
of our sympathies as extending to the thoughts and purpose
We enter approbatingly, or disapprovingly, into their opinion
This shows, of course, that logical conclusions and truly ethica
are being aroused with reference to another consciousness—rep

[1] Moral Sentiments, Sec. ii., chap. iii.

[2] Here Mr. Spencer's arguments are, as so often, rather too highly fanciful. Pri
chology, II., § 508 f.

repeated in our own conscious experience. Hence one must have certain qualities which make a good actor in order to be a moral man of wide sympathies. Suppose now that the development and refinement of this intellectual basis of sympathy is gained; suppose that, in connection therewith, the feeling of affection is so expanded as to take in an enlarging variety of objects, and so cultivated as to respond both sensitively and intelligently to all the demands made upon it; and suppose, finally, that the true moral sentiments (the "ought-feeling" and the feeling of moral approbation and disapprobation) become attached in a special way to the working of the altruistic side of feeling;—we have then the conditions fulfilled for the very highest development of sympathy. The crude natural and many-sided tendency to feel with others, however they may feel and irrespective of the consequences of such instinctive common feeling, has developed into intelligent "benevolence," or the "enthusiasm of humanity."

Many objects this side, as it were, of that abstract conception which corresponds to the word "humanity" may catch up and confine the outgoings of morally consecrated sympathy. These are as numerous as the innumerable "causes" which enlist—especially in these latter days—the sympathies of men. Here naturally it is the sufferings, oppressions, and pains, rather than the joys and successes, of our fellows which chiefly arouse this class of sentiments. In all possible phases of this kind of sympathetic feeling, the sentiment itself retains an egoistic (but not, necessarily, ethically selfish) aspect; and *the intellectual development of the individual, as related to the qualities of the object which calls the sentiment forth, determines the differentiation of the complex elements of the sentiment.* For what we call sympathy, or benevolence, in its highly developed form, is no simple affair; it is scarcely less complex than the sum-total of character. We might almost say that a man is (morally) what his sympathies are; but what his sympathies are depends no less upon his intellectual than upon his affective development.

Both in nature and in development, an intimate Relation exists between the Æsthetical and the Ethical Sentiments. Both are dependent for their higher forms upon the faculty of idealizing—that is, of transcending actual presentative experience by an activity of imagination which constructs objects in attempted correspondence with the conception of "what ought to be" rather than "what is." The spur to this activity lies in the affective side of human nature: the precise form of the object can never be fixed and defined; for the feeling is of such nature as never to be permanently satisfied, and the development of imagination itself serves only to set the end for realization yet further away. Both forms of sentiment, therefore, contain kindred elements of dissatisfaction with all imperfection, or lack of ideality; and of satisfaction with whatever answers to the changing and rising conception of the ideal. But, though similar in important respects, they are not the same. Æsthetical

sentiment is experienced rather in contemplati representing some nearer or more remote appr aspects of an ideal life; ethical sentiment is e binding command to a certain form of action. Y we contemplate such conduct as ethical sentim surveying it objectively, as it were—our complex largely one of æsthetical admiration. On the otl we contemplate the beautiful object as itself the r sible action on the part of some moral being, our c is largely one of ethical approbation. For both and the dutiful are "good;" and that things " beautiful and conduct "ought to be" dutiful, is to which the highest development of both classe leads us all.

§ 18. The deeper connection between æsthetical and e here simply noted in passing, as it were—noted, as a signific logically inexplicable fact. How the connection arises and in the development of the race, it belongs to the anthropolo tionary study of man to point out. The real connection of t the morally good in objects and, finally, in the very nature belongs to philosophy to investigate. But even descriptive psychology cannot omit to notice the æsthetical and et hopes of humanity—as phenomena of consciousness.

The Sentiments called Religious are as unmistak festation of the developed life of consciousness, as a of sentiment. They require, however, no separate the hands of scientific psychology. In general th such kinds of feeling as arise and unfold themselve tion with the work of imagination and intellect in certain classes of objects and relations. More de are the feelings of need, fear, trust, admiration, hope, love, etc., that develop from the vaguest and m ive forms of affective disturbance to the loftiest se the intellective activities present the mind with vari tions of God and of his relations to the world of th minds.

[On the psychology of the Sentiments comp. Spencer: Principles of § 503 f. Grant Allen: Physiological Æsthetics. Horwicz: Psychologisch p. 122 f. Fechner: Vorschule d. Aesthetik. Leslie Stephen: Science o viii. Guyau: Problèmes de l'Æsthétique contemporaine. Lotze: Outline Sully: Pessimism, chap. xi. Hecker: Physiologie u. Psychologie d. La Psychologie d. Liebe; and other works cited at the close of chapters x. an

CHAPTER XXV.

IMPULSE, INSTINCT, AND DESIRE

CERTAIN complex processes in consciousness seem to stand midway, as it were, between the emotions and the self-conscious choices. Perhaps it would be more correct to say that, in the continuity of the stream of mental life, psychoses arise in which feeling appears about to break over into purposeful activity for the pursuit of some recognized end—with various degrees of the blending or dominance, in fusion, of the affective and conative elements. In all conscious states of this class, however, the end toward which the feeling is excited and the purposeful volition directed, must be presented in idea by an activity of intellect. They all, therefore, have the threefold complexity which belongs to the development, in general, of conscious faculty; but their distinctive feature is that forth-putting of mental life in definite directions, which originates in some form of craving and which issues in some form of willing. In the broad but strictly etymological meaning of the word, these processes emphasize the *appetitive* nature of mind.

It follows from the very nature of all "appetitive" states of consciousness, that they are as numerous in kind as are the forms of affective excitement in which they take their rise; and these latter cannot be strictly limited, because the development of experience, considered as involving feeling with its interests and tones of "pleasure-pain," has an indefinite variety. All appetitive states have this in common, however, that they tend to set agoing the motor organism. They belong to man as made for action, as equipped and compelled to do for himself—to strive for and to obtain, to pursue and seize and mould, to satisfy his wants, and to multiply and intensify them by repeated temporary satisfactions. Moreover, since growth of experience consists quite as much in learning the proper inhibitions to motion, as in learning the proper movements to satisfy natural wants, these appetitive states are further emphasized as standing between feeling and will; or rather, again, they must be regarded as resulting from a variety of fusions of feeling and will.

Thus that is characteristic of much of this development which Dr. Ward[1] remarks of so-called desire: "When the new idea does not lead off the pent-up stream of action by opening out fresh channels, when, instead of this, it is one that keeps them intent upon itself in an attitude comparable to expectation, then we have desire."

Various terms—all of them characterized by more or less of indefiniteness—have been employed to describe these appetitive states of consciousness; prominent among them are the following three—impulse, instinct, and desire. Of the use of these terms, the following remarks are pertinent: (1) In no case does psychology intend by these words the unconscious or *merely* reflex and automatic combinations of the motor organism. The terms "impulsive" and "instinctive" may doubtless be applied with propriety to the whole list of such combinations. But such a use is not psychological, for psychology is the science of the phenomena of consciousness, as such. From its point of view, the most elaborate, as well as the most simple, impulsive or instinctive movements of the organism have an interest only as they affect, or are affected by, the processes in consciousness. (2) Impulse, instinct, and desire, considered as psychoses, are terms that may be applied almost interchangeably to explain a great variety of motor phenomena. And yet these three words, when more carefully considered, seem adapted to emphasize somewhat different aspects of the respective psychoses for which they stand.

§ 1. We have already, in treating of conation and connected forms of movement (chapter xi.), remarked upon the use of such words as "impulsive" and "instinctive." When applied to the lower animals and to children, they are well adapted for a loose and popular usage. We note with astonishment the complicated series, and even systems, of purposeful movements which some of the animals—for example, the insects, and certain of the mammals—perform; but our astonishment is scarcely greater than our uncertainty as to how far any conscious ideas, feelings, and volitions, are concerned in these movements. Without knowledge that is unattainable respecting data of consciousness, we add nothing new to the external facts when we ascribe such movements to impulse, or to instinct; we only summarize them. Thus and so the movements occur—*as though* consciously initiated and controlled; and yet we are unable to say that they are really thus initiated and controlled. In the case of the human offspring, however, our right theoretically to describe the states of consciousness corresponding to the words impulse and instinct is much more clear. This right is derived directly from adult experience, and also indirectly from the necessities of the theory of psychological development. For there is a large part of our most com-

[1] Article Psychology, Encyc. Brit., p. 74.

plicated adult motor activity which takes place in channels established, under the principle of habit, by previous experience, where the corresponding processes of conscious ideation, feeling, and volition, are very slight and obscure. In transferring the scientific description and explanation of such processes to the child, we must do the best we can by way of allowing for the vast difference between the complexity of even the most meagre adult consciousness and the relative simplicity and undeveloped character of the child's consciousness. But only so far as we are permitted to make this transference can we explain the childish consciousness at all or understand how it can grow into an adult consciousness.

§ 2. It will be our purpose in this chapter briefly to characterize the development of the more complex condition of mental life described by the terms at its head. As has already been said, these terms refer to certain different aspects of conscious conditions that are largely alike: the difference is chiefly due to the differing degrees and combinations in which ideation, feeling, and volition fuse in them; while the essential likeness is summed up in the statement that they are all expressive of "appetencies" of the mind. For example, the bird may be said to mate or to build its nest either as the result of impulse, or instinctively, or as stimulated by some vague form of desire. And we may account for human beings doing similar things by referring to a number of natural appetencies, which might be called either impulses, or instincts, or desires. We might explain the bird's beginning to fly and the child's trying to walk in the same way. In case we use the word "impulse," however—whether for the callow bird or for the callow youth—we emphasize rather the force of that craving in which the series of complicated movements take their rise. But craving, in this meaning, is a sort of resultant of feeling and conation—the latter being considered as a condition of tension that is about to break over into movement. If, however, we chose the word "instinct" we look on the same movements as having a somewhat different origin. (Here compare what was said as to the difference between impulsive and instinctive movements, p. 230 f.) We now call attention rather to the recognized ideal end of the movements, and lay emphasis on the activity of representation—or that which takes the place of representation—in connection with the purposeful character of the resulting volitions. But by "desire" we understand a feeling-tendency toward conation with a definite object in view. So that, while desire emphasizes the affective aspect of the appetency, it is also significant of a generally higher grade of mental development. Indeed, we might even hesitate to speak of the lower animals as having *desires* comparable to those of man. At the same time, if we admit mental representation of the end, and of the means necessary to attain it, as essential to an explanation of animal instincts, many such instincts would imply a degree of intelligence far in advance of that needed to account for most human desires.

By Impulse, then—as we here employ the word—we understand *a conation, initiated and fused with a feeling of craving, in view of some object of sense-perception or of imagination, with a tendency to discharge in a complicated form of purposeful movements.* We are here dealing with an appetitive condition of conscious-

ness, in which emphasis is laid upon the *being driven* or *urged* to volitions that have reference to an object as an end. In this meaning of the word, the impulses themselves imply, as the pre-condition of their experience, a certain previous development. This development, however, may be of a very rudimentary sort. It may imply simply enough of mental faculty to recognize an object as related to our pleasure-pains, and to feel attracted or repelled by it. Such feeling of attraction or repulsion then immediately tends to put into action the appropriate motor organism. But the impulses themselves develop under the influence of the complex results of their own operation, as it were. The very movements of the organism which they "impulsively" bring about have further consequences in consciousness, with respect to the changes in its objects, but more especially in respect to the changes of its feeling-tone. Any object which attracts becomes connected with our pleasures or our pains; in the former case, it acquires added attractiveness, and in the future excites a stronger impulse toward itself; in the latter case, it becomes repulsive, and in the future excites impulsive movements away from itself.

The general Development of Impulse is subject to two sets of considerations which have, in some respects, directly opposing results; thus the compound resultant in development depends upon the action and reaction of the two. First, the impulses themselves become more numerous and more complicated as intellectual development proceeds, and as experience becomes more full of content and more complex. We are accustomed to think of the child as pre-eminently the creature of impulse. This is true, however, only as indicative of his lack of deliberate and intelligent action in comparison with the large sphere covered by impulsive action. But the impulses of the adult are really far more numerous and complex than are those of the child. It follows from this that there is with the adult far greater opportunity for conflict of impulses. It is the net result of experience—other things being equal—that all human beings are attracted and repelled in a great variety of directions; and especially is it a mark of the process of development that strife arises between the so-called "higher" and the so-called "lower" impulses. But, second, the many conditions of development secure two results which modify this endless splitting-up, as it were, of impulses. (1) Certain impulses become habitually accepted as exciters and controllers of the spheres of action belonging to them. This operates, of course, in the direction of the consolidation of impulsive movements. Various forms of accus-

tomed stimuli—perceptions of one sort or another, or imagined and anticipated pleasures and pains—come to be regularly responded to with the appropriate courses of conduct. At the same time (2) deliberation and the rational regard for consequences conduce to the control, by more remote ends, of the appetencies of the mind. Thus some of them become suppressed, and others encouraged in a guarded way, with reference to the life of ideation or even to the realization of accepted ideals. This effect, too, tends in the direction of increased solidarity of the mental development so far as it is concerned with the mental appetencies.

It is by the combined result of these two sets of considerations—the one tending to increased differentiation as new experiences with objects are found to be pleasurable or painful, and the other tending to solidarity as some impulses are left unchecked to control the movements, and others are themselves brought under control, or even eliminated, for ideal ends—that the development of a mental life characterized by varied impulses, and yet having some unity of habits and of conscious purposes, is made possible.

As to the Classification of the Impulses, psychology can do little—as has already been said. There are as many impulses in all as are the various attitudes of felt attraction or repulsion before the different objects presented or represented in consciousness. Those of the lower order include all the various forms of relief for uneasiness, and of satisfaction for craving, which the discharge of the bodily functions occasions. Hence the so-called "Appetites" may be considered as impulses; since, in their unsophisticated condition, as it were, they are states of consciousness corresponding to the definition given above. Impulses are also connected with all the stronger natural emotions; since all these emotions involve some form of craving which tends to break over into a suitable motor discharge. The same thing may be said even of the æsthetical and ethical sentiments, although of these—and especially of the former—the remark is much less obviously true. The logical feelings undoubtedly operate impulsively, as has already to some extent been pointed out.

§ 3. That our impulses have their roots in conative forth-putting coupled with the feeling of craving, and tending to break over into purposeful movements, is implied in the various terms employed to designate them. They are called "inclinations" (*Neigung* or *Hang*), "strivings" (*Streben*), or conscious "tendencies" or "states of tension;" whatever is done impulsively appears of the nature of a leap from an idea seized with feeling to a conatior

suffused with feeling. There is something like being driven, when acting "from impulse," as we say (*Trieb*). All these phrases consider the relation between the resulting movement and the condition of consciousness, as though the latter were a sort of *vis a tergo*. But on considering the same relation from the reverse point of view, we may speak of the object as attractive or repulsive, and so as accounting for the state of consciousness and for the purposeful movements alike. Psychologically considered, however, it is those changes of feeling as pleasure-pain, which result from our changing relations to the object, that constitute its attractive or repulsive character. From whichever point of view we regard the relation between mental condition as appetitive and the resulting movements as affecting both ourselves and the object impulsively aimed at, it is the "drive" of the mixed condition of feeling and conation which we have in mind.

§ 4. The rise and development of the impulses, as we are now using the term, implies all that was previously said (see p. 218 f.) regarding the simplest stages of conation, and even a multitude of merely physiological (reflex or automatic) activities as lying back of these elementary psychoses. Thus we may conceive of ourselves as tracing the growth of the more complex impulses out of blind unconscious reflex or automatic movements. Even here, however, *some* feeling and ideation and consciousness of self-effort are very likely involved. The soliciting and guiding influence of pleasure and the inhibiting and guiding influence of pain, are all-important in the formation of complex impulses. The child kicks, strikes, bites, clutches with its hands, performs the various functions of voluntary bodily easement, makes its first efforts at creeping and walking, responds with the more complex imitative movements, etc., etc.—impulsively. So, also, very largely, does the trained athlete play ball or perform upon parallel bars, the boxer box, and the fencer thrust and parry; so also does the expert in mental arithmetic, or the physician, artful but not scientific in diagnosis, seize and follow the mental clue in impulsive fashion. In similar fashion do men and women fall in love and pursue the object of their passion; heroes aglow with excitement hew their way or lead their troops in battle; business men buy and sell stocks, or gamblers bet at cards. That is to say, in all these cases we have complex and purposeful movements following upon the "drive" toward a desired object which arises in a mixed condition of craving and conation; and what is noticeably left out of our account of the action—because it is really wanting in the conscious conditions—is a clear mental representation of an end to be reached by adapted and selected means, and the choices adopting the end and selecting the means.

Most important of all in the development of the impulses is the securing by experience of the right inhibitions or checks to the appetencies. The animal, the child, the insane and diseased will, and the subject of hypnotic suggestion, are all lacking in a sufficient reserve of inhibitory influences. Physiologically expressed, we may say that the "stock of reserve brain-power" belonging to the higher and more purely psychic centers is small in these cases; the discharges from the lower centers are too prompt and explosive, as it were. Psychologically regarded, we notice in such persons a lack of reserve in expressive action and in movements designed to satisfy some form of craving—a lack of "self-control." The dipsomaniac (who

drinks impulsively), the kleptomaniac (who steals impulsively), the planomaniac (who wanders off impulsively), the erotomaniac (who gratifies sexual appetite impulsively), are all examples of the victims of unchecked impulses. In all such cases, craving passes rapidly from excited feeling over into the stress of initial conation; and conation at once breaks over into motor effects. It is for reasons which lie in the very nature of these appetencies that, by "development" of the impulses, we understand almost wholly *their culture by inhibition*. Inhibition is, however, only a part of the real development, as well as of the highest development, of the impulsive or appetitive conditions of mind. For, as has already been indicated, in all complex forms of movement the best practical results require that cultivated impulses should take the initiative and should keep the lead. Reasoning, or drawing conclusions from consciously accepted grounds, is quite too slow even to conserve our safety, much less to attain the rewards of skill and art. Neither is the result of impulse always, by any means, inferior to that attained by ratiocination.

§ 5. The three forms of appetite popularly recognized—for *food*, for *drink*, and the appetite of *sex*—may properly be considered among the developed impulses; the two former are, even in man's case, comparatively direct in their working and simple in character; the latter is much more complex. The new-born child, when first offered food, probably obtains it by sucking as an almost purely physiological reflex. It is by experience in being fed that a truly psychical appetency arises. The acquired infantile appetite consists of a mixture of uneasy bodily sensations that are ill-localized, of more definite psychical desire for an object already experienced as pleasure-giving, with revived mental images of manifold comfortable sensations of warmth, fulness of the stomach, etc.; and especially of the conative tension that is ready to break over into the actual complex of sucking movements. But what we call the "appetite for food" in adult life is a much more complex affair. Indeed, in the case of many persons who have scarcely known real keen hunger, it is largely an ideal affair; it is a half-intellectual and relatively faint desire to realize certain definite satisfactions once experienced. It is an appetite for breakfast, or for luncheon, or for dinner; for this or that kind or combination of food. It is even often a mixture of anticipated sympathetic feelings of an associative sort. On the other hand, this appetite in the case of those adults who do know what hunger is, and are habitually ill-fed, is even more unlike the appetite of infancy.

What is called the "appetite of sex" is often spoken of as though it were a very simple and direct affair. On the contrary, this so-called appetite is a very variable and always rather complex mixture of sensation, ideation, feeling, and will. Even before the appetency assumes the more definite form which belongs to the age of puberty, it seems to be latent in that difference of consciousness with which children regard those of the opposite sex. Doubtless it is difficult here to tell how much is due to associations established by education, and how much is rather a matter "of nature," as we should say. In its beginnings it is often, almost as much a matter of feeling gentle repulsions, or "shyness," as of vague attractions—minglings of curiosity, desire of approbation, and undefined cravings. In many cases the same conflict between feelings of attraction and feelings of repulsion

characterizes sexual appetite even after the characteristic bodily sensations become more prominent. We have already referred to the fact that the age of puberty is itself marked by a wonderful development of obscure but powerful feelings of craving. It is at once the impulsive and the sentimental age. And what we call "sexual feeling," as though it were a definite thing instead of being a complex mixture, enters into all the relations and intercourse which exist between persons of opposite sexes. Seldom or never does it sink so low in human consciousness as to be for a long time that relatively simple bodily impulse, or craving, which man shares in common with the other animals. The rather does it ordinarily associate with itself a variety of related feelings; and, in connection with this varied affective excitement, the increased activity of imagination is to be noted.[1] Indeed, the appetency may be so refined as to assume largely the characteristics of sentiment; though not without that longing for certain relations to the object (that is, the object is never regarded in a *merely* contemplative way) which belongs to the condition as appetitive. Thus Plato was able to define *Eros* as the instinct for the ideal—the excitant of impulsive movements toward objects held up by imagination.

§ 6. The peculiar character of impulse is further seen when we consider that almost all the emotions have specially correlated impulses to which they give rise. This is due to the fact that impulse is, in its very nature, feeling blended with initial conation, on the way to purposeful movements. Thus the impulse of anger is to strike, or kick, or resist; the impulse of hatred or revenge is to injure the object of the feeling, though in a more planful way, since hatred and revenge are passions or cherished emotions; the impulse of fear is to run away or to take an attitude of defence rather than of attack, as in the case of anger; the impulse of love is to fondle, defend, and to embrace, etc. Even such feelings as curiosity, doubt, and belief, if they reach an emotional stage, manifest appropriate connected impulses. Thus we feel "impelled" to look "pryingly" at the object which excites curiosity, "suspiciously" at that which excites doubt, "confidingly" at that to which belief attaches itself. This "looking" impulse is significant of that mixture of craving and conation which belongs to all the conditions of mind which have the characteristics of appetency. And here we return to the general and most important psychological truth (comp. pp. 211–216), that man is made for action, and that every mental excitement of whatever sort is of the nature of an impelling force upon the motor organism. Even in those more restrained and hidden conditions of mind which only developed experience makes possible the same thing is true. For to restrain is the correlative of a condition of tension; and interior tension is so connected with movement of some kind as to find a natural mode of outflow and relief only in breaking over into movement.

Few words have been employed with more indefiniteness, and with a larger amount of ignorance, than the word Instinct. In

[1] Thus on the one side we find Bain saying (The Emotions and the Will, p. 136 f.): "Love is completed and satisfied with an embrace. . . . our love-pleasures begin and end in sensual contact." But as Cabanis observes (Rapports du Physique et du Moral de l'Homme): "J'ai vu nombre de fois la plus grande fécondité d'idées, la plus brillante imagination, une aptitude singulière à tous les arts, se développer tout à coup chez des filles de cet âge," etc.

the attempt to explain the wonderfully complicated and purposeful movements which some of the lower animals perform, without previous experience and so without opportunity to learn, this term is of acknowledged convenience. As has already been said, unless we fully agree upon certain describable conditions of consciousness which can be proved to exist, and then confine the term to movements dependently connected with such conditions, to speak of "instinct" is to offer in explanation of those movements the mere semblance of knowledge. The facts in the life and development of the animals which are usually covered by this term are, however, not without value to psychology. They assist us in making it more truly a study of the evolution of human mental life.

No perfectly clear distinction can be made, even in the case of man, between the impulses and the instincts. As we shall employ the terms, however, the latter differ from the former chiefly in two particulars (comp. p. 230 f.): (1) In the case of the instincts we emphasize more *the purposeful and seemingly intelligent character of the resulting movements.* They are relatively (as compared with the impulses) much more suggestive of the controlling presence of ideas which are set as ends before the mind, to be realized by a series of voluntary muscular transactions. They *seem* like the deeds of intelligent will striving to realize ideas held up by imagination and thought. How far an actual examination of the data of consciousness justifies the seeming, is a question which can probably never be answered satisfactorily. But (2) by the word instinct we mean to designate only *such activities as belong to the species, and thus exhibit themselves, either at particular periods or uniformly, in the development of the individual as connected with its welfare, as a member of the species, or with the propagation and welfare of the species.* Although, then, the modifying and exciting influence of experience may be felt upon the instincts, they are ordinarily understood to arise chiefly from the nature of the species, and not to be learned by the individual.

The attempt to apply the foregoing distinctions consistently to all the phenomena grouped under the terms "impulsive" and "instinctive," whether in the case of man or of the lower animals, will make clear its own impossibility. Impulses, in the psychical meaning of the word, and physiological reflexes and automatic movements, shade into each other; and so do the instincts shade into the so-called impulses. Both impulses and instincts in the course of development, come largely to be explained as matters of more or less definite desire and purposeful intelligent volition.

§ 7. For instances of the astonishing performances attributed to animal instinct we must refer to the books which treat of this subject. By those authors who attempt to do anything more than tell interesting stories, these performances are explained in one of the following three ways: (1) They are considered as wholly, or very largely, of the nature of merely physiological reflexes. That is to say, the complicated mechanism which the animal inherits is stimulated in appropriate ways and it responds with the customary ancestral forms of reaction. Here, of course, unless we are to reduce the animal to a *mere* physical mechanism, some conscious stimulation, some irritation of sensibility, must be supposed to take place. But whether consciousness is allowed any influence in determining the motor reaction, or is regarded as only the concomitant of nervous processes which would, without any interpolation of consciousness, perform the result—this depends much upon the writer's general psychological or philosophical point of view. Now, in the case of any sentient being equipped with a system of connected organs, the following points seem necessarily to be provided for, as it were: (*a*) The possession of the bodily organs must be dependent upon and related to their use. Under the general principles of evolution we may say that without use the organs cannot be conserved and developed. Moreover (*b*), if the being is a sentient being, and has an equipment of organs of sensation and organs of motion, the possession and development of these organs is connected with the rise and development of sentience. That is to say, the proper sensory-motor and even ideo-motor activities are inseparably linked in, as it were, with the possession and use of the mechanism (the specific set of organs which constitutes the so-called "nature" of the animal). When then a writer on instinct expresses himself as follows:[1] "Has the bird a gland for the secretion of oil? She knows instinctively how to press the oil from the gland, and apply it to the feather? . . . Has the silk-worm the function of secreting the silk? At the proper time she winds the cocoon such as she has never seen, as thousands before have done, etc."—while we cannot press the word "knowledge," and apply it to the bird, much less to the silk-worm winding its cocoon "at the proper time," we may maintain that structure and function go together, and that purposeful use of the sensory-motor organism implies a psychical relation between sensory and motor consciousness.

(2) The second way of explaining the so-called instinctive performances of animals may be called metaphysical. The metaphysical explanation of instinct may either take the form of ascribing such wonderful results to "the Unconscious" (so Hartmann), or to the wisdom and love of God who has "endowed" the animal with the instinct necessary to its well-being. Thus Göthe exclaims: "There is in the curious and kindly operations of animal instincts something which, whosoever studies and does not believe in God, will not be aided by Moses and the prophets. In these instincts I perceive what I call the omnipresence of the Deity, who has everywhere spread and implanted a portion of his endless love, and has intimated, even in the brute, as a germ, those qualities which blossom to perfection in the noblest forms of man."

(3) The third form of explaining instincts is more expressly psychologi-

[1] P. A. Chadbourne: Instinct in Animals and Men, p. 28.

cal. It regards the resulting movements as expressive of complex states of feeling, ideation and conation, which break over upon the motor organism in the form of regulated and habitual impulses, if we may so speak.

The completer explanation of the instincts requires the assistance of all of the three foregoing forms. But the purely physiological and the metaphysical explanations fall, of course, outside of the domain of psychology. Since, however, the psychological explanation, although solid and indispensable, cannot be complete, it must be given and accepted only for what it is worth. The simple fact is that we find men, and the lower animals generally, using the structure with which they are gifted by nature, in ways significant of feelings of craving, of anticipations of ends, and of adaptation of means, which considered in themselves *imply* far higher degrees of conscious ideation than, so far as we can judge, really exist. To such complex conditions of consciousness, with their motor accompaniments, we give the term "instincts."

§ 8. It is significant that one authority[1] divides the instincts in the following way:—sensation-impulses, perception-impulses, idea-impulses. It is probable, however, that all the more complex instincts in the higher animals involve all three of these forms of impulse. This is certainly the impression we get if we examine the movements of the bird building its nest, or of the spider spinning its web, or of the squirrel collecting and storing nuts, or of the infant sprawling on all fours and trying to creep, or practising its first articulate sounds, or grasping after bright objects, etc. Certain sensations, with a strong feeling-tone, blend in the particular requisite condition of restlessness and craving; the perception of various surrounding objects stimulates still further the feeling of craving and suggests some dim idea of the object toward which the instinctive craving points; and the idea, although obscure, seems in some sort to arouse and guide the will to the efforts at realization. This entire condition of consciousness is then like, but only, in most cases, faintly like, that in which we find ourselves when we are stimulated by desire, to form the idea of what will satisfy the desire, to select the appropriate means, and planfully to create the object.

It accords with our view of instinct that, in all the higher mammals, their instinctive performances are not absolutely uniform and infallible, but are modifiable by experience. It also accords, that so many of the instincts develop in connection with a certain maturity of the organism, or under certain circumstances. Such are, for example, the instincts connected with sex, with the acquirement and possession of property, and with the affections of the family life. Instincts are also, in the case of the higher animals and especially in the case of man, inhibited and well-nigh or quite suppressed by habit, as embodying the results of experience.

§ 9. From their very nature the number of the instincts in man is far less than the number of his impulses. The attempt to classify the instincts would, then, be less formidable and more likely to succeed. And yet even here we shall be most truly scientific by not trying to be too precise. For certainly almost all those natural emotions, which we have seen give rise to the impulses, more or less completely conform to our description of an in-

[1] Schneider: Der Thierische Wille; and comp. his Der Menschliche Wille, p. 106 f.

stinct. Anger and fear, curiosity and affection, in the young animal, as they become tinged more deeply with imagination and intelligence, show their relation to the welfare of the individual as a member of the species. And in the pursuit of the objects of its various forms of appetency, it may be said to show a skill which is only partially acquired—partially, then, it is to be presumed, its skill is an instinctive affair.

Indeed, it has sometimes been denied that man has any genuine instincts. The gap between his so-called "blind" impulses and his intelligent acquired aptitudes is thus left quite unfilled. On the other hand, there are some writers who ascribe long lists of duly classified instincts to human children and adults. Among such are the instincts to suck, to bite, to clasp, to put in the mouth, cry, smile, creep, walk, to imitate, to emulate, to fight, etc. So also are sympathy, and the various forms of fear, acquisitiveness, and the tendency to appropriate, called instincts. We hear also of the instincts of play, of shyness, and of sociability, of secretiveness, and modesty, and of various forms of love.[1] But it is to be noted that many of these have already been treated as belonging to the impulses and to the natural forms of emotion and affection. And when we include only such purposeful complex activities as belong to the species, as arise necessarily in the course of the development of the individual member of the species, and include vague, restless craving, faint, obscure ideation of an end to be reached in the satisfaction of that craving, and selection of means, but without clear mental seizure of the end or comprehension of the relation of the means to it, as an end—we have defined psychologically the nature of instinct; but we have correspondingly reduced its sphere in the development of the mental life of man. Yet even thus the term stands for a considerable number of activities midway between the impulses and the more intelligent and planful results of acquired experience.[2] These "instincts" are all, however, of that indefinite and complex character resulting from the fusion of sensational, ideational, affective, and conative elements, which belongs to every form of developed mental life. And the only valid reason for not calling the instincts "faculties" is, that their very nature and manner of development make us so uncertain as to how much of conscious process is responsible for the motor manifestations—for the complex and purposeful uses of mechanism.

By the word "Desire" we understand certain appetitive conditions of consciousness in which *the blended feeling and conation* ("craving" or "longing for") *is directed toward some object mentally presented or represented, of whose "pleasure-pain" characteristics we have had previous experience.* In general, then, the desires include certain more definitely developed forms of appetency.

[1] See the extended list of James: The Principles of Psychology, II., p. 408 f.

[2] The ambiguous meaning of the German word *Triebe*—impulses or instincts indifferently—favors the loosest possible classification of the animal appetencies. Thus we find one writer (Fortlage: System d. Psychologie, I., p. 309 f.) classing the vegetative physiological functions among the *Triebe*. Another (Santlus: Zur Psychologie d. menschlichen Triebe, p. 2 f.) would reduce them all to three classes—those of Being, those of Function, those of Life. But this makes the word cover the "natural" activity of all the senses, and even "nutrition" as well as "love of independence," etc. Surely such a "muddled list"—to borrow Professor James' expression—has no value in psychology.

They involve a more intelligent and contemplative attitude toward the object than do the impulses or the instincts; although, like the latter, all desires are forms of craving and initial conation (or will in a state of tension) ready to break over into purposeful movements. It is not strange, therefore, that such questions as the following have been debated among psychologists: Is desire to be classified as feeling or will; or is it, being neither, to be erected to the position of a fourth, independent form of consciousness? Is the conscious representation of pleasure (or—in the case of an object of aversion—of pain), as connected with the object, necessary to desire? Such inquiries are best answered as a result of our further consideration of this complex phenomenon.

The Nature of Desire must be understood (1) as growing, in part, out of the dependence of feeling and willing on the work of imagination and intellect. Real *desires*—as distinguished from impulsive and instinctive appetencies—do not originate until intellect has so far developed as to make a presentative and representative knowledge of objects possible (*ignoti nulla cupido*). Hence desire has rightly been called by one author [1] a "subjective-objective phenomenon"—that is to say, a phenomenon in which subjective feeling is directed outward toward an object. Still further, the object which excites desire must be contemplated as standing in some relation toward ourselves. Yet again, the more definite, strong, and persistent desires require that the object should be held before the mind as both related to feeling, with its tone of pleasure-pain, and also to will as, at least, a possible object of attainment. In this respect the contemplation of objects which excite desire differs markedly from that attitude in which we find genuine æsthetical sentiment awakened.

The nature of desire requires also that we should consider (2) its relation to feeling. Without excitement of feeling there is no desire, and yet desire is not mere feeling. Different kinds of feeling, however, stand in different relations to desire. In general, the massive, low-toned pleasurable feelings are freest from admixture of desire. The emotions, with their natural impulsive character, as intellectual development goes on, tend to feed the desires increasingly; indeed, there are certain states of mind which might be called, almost indifferently, either "passions" or "desires." On the other hand, there are massive, low-toned conditions of pain—vague or more solid miseries endured passively under the law of habit, or because we have no "idea"

[1] Volkmann: Lehrbuch d. Psychologie, II., p. 399.

they can be helped—which are almost totally free from desire. Besides, as Dr. Ward has said:[1] "Instances are by no means wanting of very imperious desires accompanied by the clear knowledge that their gratification will be positively distasteful." Yet, doubtless, the general rule is that we desire those experiences with which remembered or anticipated pleasure (including relief from pain) is connected; and we feel aversion toward those experiences with which remembered or anticipated pain is connected. But (3) desire is, of all conditions of consciousness, most nearly continuous with, most closely cognate to, what we call "willing." It is confessedly only a step from "I want badly" to "I will have." And in the case of intense desires habitually gratified, it is difficult to draw the line precisely where this step between want and will takes place. Hence that consciousness of striving, of stress, and of effort, which belongs to all strong and well-marked desires. "I want," "I will to have," "I strive to get"—these follow one another in their natural order, unless inhibited. It is this absence of the self-conscious active element, of the initial and as yet restrained volition, which chiefly distinguishes much of our admiring and regretting from our desires and our aversions. In desire, as such, there is a *dynamic* element which does not belong to feeling, as such. How desire differs from volition and choice—the genuine and completed "deed of will"—we shall see later on.

§ 10. There are few subordinate subjects in psychology which have been more vaguely and unsatisfactorily treated than this—the nature of desire. It will be of service to illustrate and enforce the right view, which regards desire as a peculiar complex development resulting from the combined activity of ideation, of feeling with its experience of its own tone of pleasure or pain, and of conation—as given above—by citations from a few authors. Herbart[2] and his followers regard the desires as forms of the striving of the soul after the appearance in consciousness (the "realization") of certain ideas. So Volkmann[3] considers desire as the becoming conscious of the effort (*des Strebens*) toward, or against, some idea. This fanciful definition implies the truth that desire is a condition of consciousness in which knowledge of some object, as possibly or actually related to our pleasures or pains, gives rise to a feeling of longing and effort, indicative of combined affective and conative activity. Approaching the matter still from the same point of view, we may go on to show how desires vary in content, strength, and rhythm; and how they accord or conflict with each other, as the presence of the objects in consciousness varies, or our knowledge of the actual and possible relations in which they stand to the *ego* undergoes change.

[1] Article Psychology, Encyc. Brit., p. 74. [2] Psychologie als Wissenschaft, L., p. 149.
[3] Lehrbuch d. Psychologie, II., p. 397 f.

Another author,[1] while showing that every desire has three elements—a sensational, a representative, a dynamic—adds, in somewhat sentimental fashion, that all desire springs from love—arising at the point where the emotion, passing beyond its actual object, aspires to have a more complete possession of it. Joy, which is desire in possession of its object, differs from pleasure—the former being a passion, and the latter a sensation or emotion. Thus we have emphasized the affective side of desire, as impulsive feeling. Yet another writer,[2] after remarking that the feelings form the foundation of the desires, that rarely does any feeling exist long in a man without producing one or more desires, and that there is perhaps no desire which does not have its root in some feeling, goes on to say: "A desire is a force." "A desire in any being is a striving of that being either to attain some feeling of pleasure or to be relieved from some feeling of pain." These words emphasize the impelling or conative and stressful nature of the feeling-factor in all desire. Hence the proposal to call the desires "active feelings." But, finally, we find many authorities regarding the desires as almost if not quite purely, exhibitions of will. *Effort*, one such writer[3] holds, is the peculiar kernel of the *ego* and of its activity. "We designate an effort as effort *after* an *a* (i.e., some particular desire), when we know that the effort attains its end in the actualization of an *a*. We call it *our* effort after an *a* so much the sooner, the more comprehensive the psychical effort which attains its end in the actualization of an *a*."

§ 11. Two arguments may be adduced against the dependence of desire upon definite mental representation of an object as related to the self in a way to excite interest. First, it may be claimed that children exhibit plain signs of this affection before intellect is sufficiently developed to furnish the knowledge which such a theory of the nature of desire requires; second, it may be said that all adults at some time, and adults of a certain temperament habitually, have states of intense craving which are not fixed by any definite process of ideation. The facts involved in both these objections must be admitted. But as to the first objection, it may be replied that, while such unintellectual appetencies must be admitted to exist in infancy, it is just the growth of experience as affecting mental representation which makes the difference between blind impulse and genuine desire. The child impulsively reaches for the fire, and after experience of its effects shrinks from it with aversion; but after, and on account of, his experience he reaches, with desire, for his nursing-bottle. So that, even in the case of the earliest and intellectually most undeveloped desires, there is truth in the view which regards them as "powers of memory," or as "inner powers of apprehension" determined "feeling-wise."[4] Nor do the states, or temperaments, which might be called "intellectually impulsive," disprove the view we have taken of the nature of desire. On the contrary, they confirm it. Here rests the psychological account of that general restlessness, and fleeting, manifold, but vague desire—that feeling of, and yet striving against, the in-

[1] Rabier, Leçons. etc. Psychologie, pp. 149 f., 483 f. This author seems to accept Spinoza's view that the one principle of all the personal inclinations is the love of being, or the effort to continue in being.

[2] Harteen, Grundzüge d. Psychologie, pp. 119 f., 177.

[3] Lipps, Grundtatsachen d. Seelenlebens, p. 603.

[4] Comp. Beneke, Pragmatische Psychologie, I., p. 206; 278 f.

tolerable oppression of ennui—which is the fault, charm, danger, and secret, of the most brilliant intellectual, æsthetical, and ethical life. For the ceaseless entertainment by imagination of various ideals operates upon a sensitive mind to produce something like the same vagueness of craving and impulsiveness of will (here, however, directed into certain channels of attention to objects of thought and to speech about them) which characterizes infantile desire. In this regard Madame de Staël, for example, and the young child, may be said to be alike in the indefinite character of their desires.

§ 12. The question whether we can have desire without consciously representing to ourselves the attainment of pleasure as resulting from some possible relation to the object (its possession, use, affection, etc.), has been much debated. On this question we find two extreme views, one of which asserts that what we desire *is* the pleasure or the relief from pain (which is only a form of pleasure); the other of which holds that the object of desire need *not* be represented as "good" at all, or even that the idea may pass into volition without any connection by way of pleasurable or painful feeling. Such truth as these bald forms of statement have can be apprehended only as we remember how complex and variable are the elements and forms of desire; and also how the desires are liable to modification under the laws which control all mental development. We have seen that the very meaning of desire, as the most intellectual form of appetency, implies that what is desired has already been experienced as a good. But intense desire is itself a painful state of mental tension; when prolonged, it may become an intolerable condition, relief from which, even if such relief is accompanied by sorrow and pain, may be of all things most to be desired. Thus we find persons afflicted with morbid and insane desires doing deeds which —say they—"we had to do;" but to which in themselves they feel an intense aversion. Moreover, the immense and overpowering influence of habit must not be neglected. Certain desires grow "imperious" by being indulged. By habit also the memory or anticipation of pleasure or of pain becomes so attached to the object that it, irrespective of any conscious representation of its possible relation to the self, becomes attractive or repulsive. Still further must there be acknowledged the existence of morbid and "unnatural" appetencies or desires. Some of these have their roots in concealed diseases of the organism, some in irrational curiosity, some in the binding power of strange associations; and some originate we know not why or whence. On account of the connection between desire and "deeds of will" we find in such desires the "causes" (rather than the "reasons") of many grotesque actions and terrible crimes.

§ 13. Desires range themselves either in series upon the same side as involving and furthering each other's ends, or on opposite sides, as incompatible. Hence the possibility of desiring, on "some account" and as means to a desired end, what in itself is an object of aversion. Thus the lazy boy desires to get his hated lessons, because he desires the promised half-holiday or has a strong aversion to the punishment which follows failure. In the complex life which all men live, almost all their desires are conditional —another proof that, while impulse is blind, and instinct only *seems* to see the end, desire is more dependent than either of the other conditions of appetency upon imagination and thought. Hence also, liveliness of imagina-

tion and consequentiality of thinking are necessary to give strength and guidance to desire. He who cannot steadily hold an end in mind, and think out the consequences of conduct, is likely to be fickle in his desires.

In that conflict of desires which necessarily takes place—since most "goods" are incompatible with each other and experience makes us know this to be so—one desire may overcome the other and lead on to its own appropriate deed of will; or the two may hold each other in check and prevent the satisfaction of either, while dividing the appetitive states between themselves, as it were. Or, again, both may subside into quiescence, or yield the stream of consciousness to some new desire stronger than either of the two. Habitually triumphant desires may become dominant and even monstrous passions; and this no matter how "noble" they in themselves are. Thus we read of one Montelli,[1] whose desire for knowledge had grown to such proportions that he led the sordid life of an intellectual miser, and died a most learned and yet useless wretch.

§ 14. Finally, the nature of desire is shown by a consideration of that complementary condition of consciousness which we call "satisfaction." Feelings, ideas, and volitions as such, do not imply either dissatisfaction or satisfaction. But we have seen that all desire is essentially, as respects its emotional element, a condition of craving or dissatisfaction. The attainment of that which is desired is followed by an unique form of "easement," —the pleasurable state of satisfaction. The principal part of satisfaction seems to be negative and reactionary, as it were. The particular form of complex and painful craving which characterized the desire, as well as that conative condition which has been recognized as the "effort" belonging to desire, are now at an end. In most cases, indeed, these are succeeded by a condition of pleasant relaxation from strain, or of massive comfortable feeling, or of positive happiness amounting to joy in possession and use of the desired object. In cases of satisfied desire, where the cessation of the desire is followed by pains of body, thought, or conscience, the unique pleasurable character of the satisfaction, in itself considered, is no less certain. The man who with a weak organism, a sensitive imagination, or a tender ethical sentiment, has gained his desire, is no less satisfied of that particular form of painful craving, because he has replaced its pains by yet keener and more lasting ones.

In general, the pure and complete satisfaction of the desires becomes more difficult and rare, with the increase of intellectual, æsthetical, and ethical development. As a rule, the richer the life of the mind becomes, the more imperfect are its satisfactions. In compensation for this, however, we are to consider the lessening, under control and the formation of habits, of the painful intensity of unsatisfied desires, and the increased amount of mild and complex satisfactions which the very multiplication of the forms of desire makes possible.

If we were to begin our attempt at stating the Kinds of Desire by an analysis of the conscious life of different individuals, we should have to say that there are as many desires, for each individual, as there are kinds of objects which he has found pro-

[1] See Beaunis: Les Sensations Internes, p. 57.

ductive of good. On the other hand, the manifold aversions of the individual are determined by his experience with the pain-producing quality of different presentative and representative objects. Nor should we thus exhaust the list possible; for there exist also certain abnormal or pathological desires, and other desires which persist in spite of the experience that their satisfaction is accompanied or followed by painful feeling. In fine, then, the very individuality of every individual consists largely in just this—the character and number of his dominant or subordinate desires. Of course, we may generalize and classify according to the origin of the craving and the character of its corresponding satisfaction. We thus arrive at this division of the desires: (1) Sensuous desires, or those which arise out of bodily cravings and find their satisfaction in the possession and use of some physical object; (2) Intellectual desires, or the cravings that arise from the constitution of the mental faculties and find their satisfaction in mental exercises, or states, regarded as objects or ends to be attained; (3) Sentimental desires, or those which arise in the contemplation of some form of the beautiful (æsthetical), or of the morally good in conduct or character (ethical). To these might be added (4) a fourth class of desires to which we have already given the title, pathological.

The foregoing classification, like all attempts at classification, only serves to make more obvious the shifting and complex nature of all the principal forms of desire as they are actually experienced by the developed human consciousness.

§ 15. For example, the "desire of wealth" may be a mixture of the sensuous, intellectual, and sentimental, combined in varying proportions—as we should doubtless discover if we could get at the full conscious content of this desire in the minds of those who have it most powerfully. In many cases the descriptions would emphasize the sensuous satisfactions which wealth secures, in others the possession and use of wealth as a means for the satisfaction of intellectual, or æsthetical, or even ethical desires; while in still other cases this desire seems to be a sort of restless craving for the intellectual and practical excitement connected with the pursuit of wealth, or has taken a really pathological character and become a "craze" after an object which the pursuer himself knows will give more pain than pleasure in its possession. Somewhat similarly complex are the so-called desires for "fame" and "power," etc. But the desire with which we regard our various objects of personal affection is most obviously a compound of all the principal classes of normal desire. Particularly true is this of the desire that enters into the more refined forms of love between the sexes.

Finally, we note that the complex, higher forms of appetency cause us to take a significant and comprehensive survey of the

mental life, both in the backward and also in the forward direction. For desires derive all their wealth of content from the various developments of memory, imagination, and thought; while they imply every possible form of feeling, with its characteristic tones of pleasure or of pain. Their development is, therefore, to be understood in the light of all that has thus far been said regarding the development of the intellective and affective aspects of consciousness. But just as plainly do they point forward to the development of that other aspect of mental life which we are now to consider—the unifying of the phenomena in the "willing" mind.

[On Impulse and Instinct, comp. James: The Principles of Psychology, II., xxiv. Chadbourne: Instinct in Animals and Men. Lindsay: Mind in Lower Animals. Romanes: Mental Evolution in Animals. Lloyd Morgan: Animal Life and Intelligence. Schneider: Der Thierische Wille; and Der Menschliche Wille. Spencer: Principles of Psychology, II., p. 432 f. Münsterberg: Willenshandlung, p. 92 f. Santlus: Zur Psychologie d. menschlichen Triebe. Grube: Triebleben d. Seele. Preyer: Mind of the Child, I., xi. Perez: L'Education dès le Berceau, iv., 5. Beaunis: Les Sensations Internes, ii.–vi. and xvi. On Desire, besides the sections devoted to this topic in other works on psychology and ethics, see especially, Sidgwick: The Methods of Ethics, iv. L. Stephen: Science of Ethics, ii. Waitz: Lehrbuch d. Psychologie, § 40. And Volkmann: Lehrbuch d. Psychologie, II., p. 397 f.]

CHAPTER XXVI.

WILL AND CHARACTER

THE mental phenomena which it is customary to group together under the term "the Will," are of all perhaps the most subtle and complex. The reason for this fact is chiefly found, however, in the relations sustained to each other by the three classes of factors (intellective, affective, conative) which enter into all mental states. As the development of mental life proceeds, the work of perception, ideation, and thought becomes increasingly elaborate; while the variety of emotions and sentiments grows to be correspondingly great. Now, *will* is a word traditionally used to express the sum-total of all our performances—whether in the form of physical movement or of more purely intellectual, æsthetical, and ethical pursuits, under the "guidance"—as we say of reason, and because of the "motives" furnished by our various emotions, sentiments, and desires. Thus "willing" (*Wollen*) comes to be almost coextensive in our thought, with that entire sphere of "acting" (*Handeln*), and even of "doing" (*Thun*), which we call *our own*. In this same way are we led to apply to human beings, with comparative rareness, the distinction between action and conduct; the rather are men inclined to regard each other as somehow responsible for all that they do, unless the doing is known to be in no respect under the control of the voluntary motor apparatus. Even the perceiving, imagining, thinking, and believing of others are chiefly considered by us as matters of conduct; and thus we hear it popularly said:—He *ought* to be able to see this; and *ought* to know that; and even, It is *wrong* for him to think in that way, or to believe in the other way, etc. Such language, and the impressions and experiences on which it is based, however crude and psychologically unsatisfactory, are exceedingly significant; for they show how strong the tendency is to regard a man's will as extending over all his actions, and to identify with the sphere of Will the whole of what we call character.

On the other hand, the real psychological kernel of this so complex group of phenomena, in so far as they belong distinc-

tively to "*will*," seems remarkably simple. It is, indeed, so simple as to defy analysis, for the very opposite reason from that which makes analysis so difficult in the sphere of the feelings. In treating of the primitive character of conation it was said (p. 211 f.) that psychic facts, considered simply in this aspect, "have only one kind." "As such, there is one and only one sort of conation." We shall not really depart from this position now as we resume the discussion of the development of mental life, considered chiefly in its conative aspect. We shall indeed speak of volitions, choices, purposes, and plans; but all these processes in consciousness must be considered as modifications of the intellectual content and affective condition under which one and essentially the same phenomenon of conation takes place.

When then we speak of the development of the will, our reference is really to the progressive acquirement of those complex intellectual and emotional conditions under which the conative activity of the individual takes place. Development of will is development of knowledge as to ends to be chosen and realized, and as to means for the realization of the chosen ends; development of feeling in the formation of emotions, sentiments, and desires; development of skill in the use of the motor mechanism, whether external and obvious, as in the movements of the limbs, or internal and concealed, as in the mechanism connected with the fixation and re-distribution of attention, and the control of the mental train. But the repeated activities of conation—like all the phenomena of mental life, and especially so, because we may regard this law as having its seat, so to speak, in the will—fall under the law of habit. In the development of intellect, of feeling, and of motor manifestation of conscious processes, the conative factor appears ever present; it also *appears*, at least, as a determining fact. Thus—to speak popularly—if it be true that I am always dependent upon ideas of ends and of means and upon motives of emotion and desire for what I will; it is also true that what ideas get accepted as *my* ends, and *my* means for attaining the ends, and what motives become most powerful *with me*, depends upon what "I will." For the present, this popular way of representing the apparent truth may be taken to mean that the whole mind—intellect, feeling, and conation—develops together. But in what sense there can be a development of will considered as abstracted from all development of intellect and feeling, it is impossible to say. This, however, need give us no anxiety; for the difficulty arises from that abstract way of speaking of the faculties as though they were entities, or at least modes of being or behavior, separable from

each other. The simple truth with which we are now concerned is this—in the course of their development, and as dependent upon the growing life of memory, imagination, thought, and feeling, men come to be able to make choices, to select ends and means, to shape conduct, and to form far-reaching purposes and plans.

"*To will*" (*in the highest sense of the word*) *is then the result of a development; it is something which no one can do at the beginning of mental life, but which all men learn to do in the course of its unfolding.* To exercise "free will"—in any conceivable meaning of this term—is not a birth-right; it is rather an achievement which different individuals make in greatly differing degrees. But willing, as conscious self-activity, does not manifest itself as early and as persistently as sensation or feeling; and in the developed consciousness, that which we mean to indicate when we say "*I will*" is a unique phenomenon. It is not to be confounded with emotion, affection, or desire; much less is it mere consciousness of movement following upon sensation, ideation, or thought.

§ 1. Says Höffding[1] pertinently: "As in Greek mythology Eros was made one of the oldest and at the same time one of the youngest of the gods, so in psychology the will may, according to the point of view, be represented as the most primitive or as the most complex and derivative of mental products." The failure to observe and give due weight to this truth has resulted in much confusion on the part of writers on psychology and ethics. The primitive root of will in conation—that which in respect of the third aspect of all conscious psychic facts makes conduct, as distinguished from mere action, possible—has already been discussed (Chap. XI.); it has also been seen how conation stands related to movement and motor consciousness, and to the fixation and distribution of attention in the different fields of consciousness. All our conclusions upon these points must now be recalled and understood anew in relation to the development of so-called "Will." Furthermore, the entire nature of the life of intellect and feeling, and the trend and laws of the development of that life, must be borne in mind and applied to the understanding of volitions, choices, resolutions, planning, etc. In the intellective aspect the important thing to notice in reference to a correct psychological theory of will is its increasing "teleological" significance, as belonging to the very life of memory, imagination, and thought. As intellect develops, more and more remote and comprehensive ends are set before the mind, and a wider and more precise knowledge of means adapted for the realization of these ends is acquired. Memory, imagination, thought—all necessarily take part in this increased recognition of the teleological idea, this conscious awareness and pursuit of ends by use of means. Indeed, each act of recognitive memory, of productive imagination, of logical conclusion on recognized grounds, is in itself an act of obedience to the principle of final cause. Even in those cases where, under the beneficent

[1] Outlines of Psychology, p. 308.

effect of another principle (which we may call, somewhat vaguely, the "principle of habit") these activities, having been frequently performed with more or less recognition of some end in view, come to resemble instinctive performances, their teleological import as affecting the development of mental life is only the more apparent.

What is true of the intellectual faculties is true of feeling as well. The unformed life of feeling consists of relatively few and simple affective states (connected chiefly with bodily sensations and appetencies) which furnish blind and unchecked stimuli to the movements of the bodily organism. As this life develops in dependence upon the development of the life of perception and ideation, the variety of feelings, and of their consequent conflicting emotive discharges, is greatly increased. And if some influence from the principle of teleology were not exercised in the realm of emotions, continued development, and even continued existence, would be psychologically impossible. As, however, the feeling-impulses become desires, and some of the desires are weakened or eliminated by being habitually inhibited, while others grow into either deep-seated passions, or elevated sentiments, or into dispositions and tendencies and habits, by frequently "having their own way," the organization of the life of feeling goes on. And here that very dependence of complex affective states upon intellect, which contributes to their variety, also makes it certain that they, too, will shape themselves according to some system of means and ends. This is true even when the ends are no other than the satisfaction of the momentarily stronger desires or of the more permanent passions.

Now, it is into this self-forming system of means and ends, as securing the organization of the life of intellect and feeling that—we may figuratively say—Will enters; nay, within it *is* the willing mind, regarded as definitely adapting the ends, selecting the means, checking or indulging the appetencies, and planning, resolving, controlling, as respects the entire trend and issue of the course of development. And if we are reminded that such language is figurative and encourages a psychologically false division into faculties, we admit the partial justice of the accusation. But we repeat that the other style of speaking, which represents the phenomena of "willing" as only the resultant of a superiority in strength of two contending muscular sensations, or of two desires, is equally figurative. We are obliged by the very nature of our science, which describes the phenomena of consciousness as such, to reaffirm the reality of conation as an irresolvable factor in all psychic states; and to maintain the perfectly unique character of that which we know takes place when we use intelligently the words, "*I will*." In view of the prevalence of the teleological principle in mental life there is certainly ground for asserting with M. Paulhan: "Every idea, . . . every sentiment, in brief, every psychic system tends to complete itself by volitions and motor phenomena; every system has its own will."[1] But the essence of what we call preëminently "*the* will" involves "a sort of trial of psychic systems"—each tending to impose itself upon all the others, to the end of completing itself, and of the conscious adoption of one of these systems to the exclusion of the others. All the way through, then, the complex phenomena involved show their conformity to the idea of final purpose. "*Will-*

[1] Comp. L'Activité Mentale, p. 59 f.

ting," in all its developed manifestations, implies knowledge and feeling with reference to means and ends.

By the word "Volition" we understand *a definite conative activity consciously directed toward the realization of a mentally represented end, preceded or accompanied by the condition of desire, and usually accompanied or followed by the feeling of effort.* A volition is then a complex activity in which conation is emphasized as central and determinative, but as dependent upon intellect for its direction and upon feeling for its so-called "motive" or impulse. In considering the nature and development of the volitions we enter the sphere of conduct; and every single volition may be called "a deed of will." In actual experience, here as everywhere else, the principle of continuity is maintained. Looking at this exercise of so-called faculty, we cannot draw the line precisely through the place where it emerges in obvious distinction from previous involuntary conative acts; nor can we, in the case of individual volitions, always say—just here, and nowhere else, in the swift-flowing stream of consciousness did impulse or desire, wishing and craving, give way to a genuine deed of will. In fact, most of our volitions flow forth so silently and smoothly, as it were, from the very interior of the self, that we have to turn to those rarer and relatively extreme cases, where the will asserts itself more definitely and even violently, as it were, in order to understand its distinctive character. In two respects, however, all volitions are distinguished from *mere* conative activity; for they imply mental representation of an end to be realized, and excitement of at least some faint form of desire.

There are, moreover, several respects in which different forms of volition differ greatly; and these differences, by the many combinations of which they admit, result in coloring our deeds of will so strongly that they scarcely all seem alike fit to be brought under the same term. Among these differences the following are most important: (1) The end toward which volition is directed may be conceived with more or less distinctness; or it may be more or less familiar or strange; or it may be in its nature more or less remote and difficult of realization. Thus the character of the intellectual activity connected with the presentation or representation of that which is willed profoundly modifies the complex nature of the volition itself. The character of every volition depends on the content of what is willed. It is one thing for the child voluntarily to stretch out its hands to the nurse or to the toy, and another thing for the man of science to decide upon the course of experimentation which has just flashed into

his mind as a means proper to a remoter end in the discovery of some ulterior scientific truth.

But (2) two or more ends may be presented to the mind in quick succession, both of which cannot be willed, because they are presumably or certainly incompatible; and in connection with their mental presentment conflicting desires may be excited. Here—whereas in the preceding case we may suppose the volition to be "unimotived," since only one end, and that a desired one, is presented—there is need for choice. And choice itself may be either between two or more ends, or it may be choice between acting and not acting. In all cases, however, volitions which are choices have a somewhat distinctly different character from unimotived volitions.

Yet again (3) the amount of the desire excited varies greatly in different cases of volition; and so does the character of desire, whether it be sensuous, or intellectual, or sentimental, or pathological. The various amounts and kinds of desire which form the so-called motives for our volitions, greatly influence the coloring taken by the deed of will itself as it emerges in consciousness. Sometimes the volition is pale and nerveless, as it were; because desire has been faint, or having at first been strong, has finally suffered a collapse. Sometimes it is blood-red, because stained with the streams that have poured out from the vital centers of appetite and passion. In connection with the two just foregoing differences occurs another—namely, (4) the amount and character of preceding "deliberation." It is this, indeed, which emphasizes our most genuine and unmistakable deeds of will. But *deliberation* is, in truth, itself a sort of mixture of intellect and inhibitory volition. We speak here not simply of the influence which this mental process of weighing ends and of comparing means and consequences, has upon the question, which one of two or more possible volitions our choice shall be: we speak also of the fact that the psychological character of the choice is itself greatly dependent upon the amount and kind of the preceding deliberation; the resulting deed of will has a different tone, according as it has, or has not, been preceded by deliberation. Reckless will, hasty will, excited will, cool will, rational will, reluctant will, exhausted and breathless will, etc., are among the many popular ways of expressing these differences.

Volitions differ, moreover, (5) as to the relations in which they stand toward the psycho-physical apparatus for control of the organism. Here one chief distinction is between (*a*) volitions of inhibition and (*b*) volitions of positive innervation; or between

those which are adapted to check the impulse to act in a certain way, and those which are adapted to produce, as we say (and are actually, in the order of nature, followed by), a certain determinate form of action. In connection with these distinctions we experience the influence, upon the entire state of volition, of all the various modifications of the feeling of effort, whose nature and origin have already been discussed (p. 221 f.). Both volitions of inhibition and volitions of positive innervation have their characteristic feelings of effort. In the one case, this feeling may be described as that of offering resistance to the tension connected with every form of appetency or desire; in the other case, it is rather described as that of overcoming resistance. Figuratively speaking, in the one case "I will" *not* to let, at once, impulse, appetite, desire, have its own way with me and bring on its appropriate form of action; in the other case, "I will" *that*, in spite of certain resistance from impulse, appetite, desire (and these may take the form of disinclination to do anything), a certain form of action shall take place. Here it is customary to speak of the longer or shorter period of struggle which blends with, or follows, the more purely interior deed of will, as a *nisus* added to the volition. This *nisus* itself, however, is necessarily "backed up," as it were, by a repetition or prolongation of the volition. All these elements, in their complex resultant, enter into the conditions of willing, as we are now using the term. But other volitions of both classes (whether of inhibition or of positive innervation), instead of being marked by more or less intense feelings of effort, are characterized in precisely the opposite way. They are marked by a wonderfully grateful sense of relief. The will to "let go," "to surrender the struggle," "to yield to desire," etc., are volitions of this sort. So also, in cases where deliberation has been long and painful, the making of the choice is characterized by the very opposite of the feeling of effort. Even where the task set by the volition is in itself a severe one, whether of obvious bodily movements or of the control of attention and the train of ideas, it seems lightened as it is voluntarily assumed—so conspicuous is the feeling of relief accompanying and following the resolution of the *nisus* and the perfecting of the deed of will.

§ 2. The developed form of Will, to which we give the name *volition* (proper), differs from mere conation or primitive attention, by being consciously determined according to some recognized "content." *It is will which knows what it wants.* Such an act of will was recognized by us long ago when, in the chapter on this subject (p. 61 f.), we spoke of voluntary attention as a "purposeful volition;" and yet again when, in a later chapter,

we spoke of ideo-motor and voluntary movements as developed forms of conation. Here the distinctness with which the content of the conative activity is presented in consciousness admits of an indefinite number of degrees; and these degrees separate the most blindly impulsive from the most intelligent of our conations. This relation of volition to intellectual content is observed when men try—as they habitually do—to excuse themselves from the charge, both of ignorance and of immorality, by saying: "I did not think what I was doing." On the other hand, they excuse themselves from the charge of immorality, but not of ignorance, by alleging: "I did not know what I was about." In the one case, the volition closely resembles a mere impulse; in the other, it has the character rather of a volition proper, but of one determined on insufficient grounds. A child who did not remember the unpleasant consequences which followed previous impulsive states of fear, or anger, or desire, and so did not recognize, on its renewed presentation in consciousness, the character of any particular action or course of conduct, would remain incapable of volition. It would continue to run away, to strike, to bite, to reach out its hand for the candle—*impulsively;* it would not inhibit these movements by a genuine deed of will. The dependence of volition proper upon the recognition of objects as ends, and upon the mental representation of the consequences of previous impulsive acts, is further illustrated by the pause which often occurs when unfamiliar objects are presented. This pause is indicative of the question—What to will. The sensuous attractiveness or aversion awakened toward the object is, of itself, sufficient to occasion impulsive movement; but the demand to act in view of an intellectual determination, to know beforehand what we are going to do and what consequences we are to experience as the result of our doing, is necessary to a genuine voluntary movement. Shall I eat this strange kind of food? or drink this unfamiliar form of drink? or trust myself to this unaccustomed vehicle (*kago* or *sampan*)?—such are some of the inquiries before which hungry, and thirsty, and hurrying travellers have to form volitions when in foreign lands.

All these variations in the character of our volitions, as dependent upon intellectual attitude toward the ends proposed, are, of course, connected with variations in stress of desire, in amount of deliberation, etc. Volitions are also characteristically different for different persons. Some wills are rapid and impulsive in movement; others are equally rapid in movement but clear and strong in intelligence. So the individual volitions may at certain times be characterized by a comprehensive and firm mental grasp, although the necessity for making up one's mind at once be imperative. For example, let a horse be running away in a crowded street, or a child fall overboard from a ferry-boat, and one looker-on will stand "will-less" because intellectually stupefied, another will rush to action blindly, while still another will choose the best means of action with a coolness of judgment that furthers instead of hindering promptness of movement.

§ 8. The dependence of the character of volition upon the amount and character of desire, and upon the relation which the will—so to speak—assumes to the desire, is most marked and influential. In this respect men of different temperaments and habits of action differ greatly; so also do different volitions in the voluntary life of all individuals. Some men of little

passion or excitement from any form of feeling, habitually exhibit great energy and firmness in volition. Here again, "the Will" may be intellectual and directed by a clear mental grasp upon ends; or it may seem to be more largely blind, mere conative energy, a relatively unthinking and unemotional forth-putting of volition, but with marvellous strength and tenacity. Men of the latter class often acquire a reputation for "strong will" (more correctly, obstinate will). Even in cases of equally intense emotional influence immediately preceding the volition, great differences appear in the way in which this affective influence gets taken up into the volition, or adopted by the will. Frequently the experience occurs which is described as being "swept away" by desire, and so willing the thing wanted because one can scarcely, or not at all, help doing so.

At other times desire or passion is itself voluntarily espoused and made an adopted child of the will. Then "I will" means not simply that desire, although resisted, has at last got its own way; but rather that *desire*, even perhaps after being brooded over and resisted, *is now itself part of what I will*. Such phenomena occur not only in cases where the deed of will is one that needs for itself the continual influence of passion to hold it firm and strong, but also in cases where this deed, under the influence of some ulterior consideration, is itself directed toward doing a certain action with the accompaniment of a certain frame of mind. The frame of mind is then willed as a part of the complex action. So fanatics and reformers often act with a *voluntary passion*. Indeed, as Balzac pertinently says: "Fanaticism, and all other sentiments, are living forces. These forces become in certain beings rivers of Will, which gather up and carry away everything." So also is the steady glow which many of our affections display, due to the manner in which we will that attention shall be given to them, and that they shall be *motifs* which lead to, and suffuse, our actions, or indeed our entire life of conduct. For example, this voluntary adoption of passion and desire, so that the character of the adopting volition is itself modified, is distinctive of the mental attitude of the lover to his mistress, of the patriot to his country, of the student to his pursuits, and of all passionate devotees to any person or cause. It is as true in its way that there are voluntary passions (states of emotion and desire which are willed) as that there are so-called voluntary acts which are little more than unwilled resultants of passionate feeling. And, indeed, generally, there are many degrees of the mixture of emotive and volitional elements which we characterize by such words as volition, choice, and purpose. For, it cannot be said too often: *In every developed "deed of will" the whole man acts; and there is no such thing as a "willing" to do which is not a complex resultant of all these fundamental forms of so-called faculty.*

§ 4. That what is called "deliberation" is a most important modifier of the character of our volitions, is a truth assumed by all naïve as well as elaborate ethical theories, and illustrated by the language and practice of men on every hand. This truth is evident at once on considering the influence from the lapse of time over both the intellectual and the affective antecedents of volition. If volition is to be intelligently directed toward an end that is at all complex or remote, and especially in case both end and means for its attainment are unfamiliar, the process called "making up one's mind" as

to what to do cannot take place without deliberation. The study of mental development shows us how the infant's instinctive pause of surprise and hesitation before the unfamiliar becomes, as the intellect develops, the deliberate inhibition of action and the weighing of considerations (*libero*; I weigh in a *libra*, or pair of scales) that bear upon intelligent action. As has been said, not only is the volition thus determined as to what it shall be, but its very character as an act of will is thus changed. In this way volition itself becomes the conscious adoption of an end. In the most highly developed cases, then, the "I will" takes place only after memory, imagination, and thought have been employed to set forth in consciousness the value—sensuous, æsthetical, or ethical—of the end to be willed; and perhaps (in cases where choice is made between this and some other end) to estimate carefully its place in the "psychic systems" which are nearly simultaneously bidding for supremacy in the allegiance of the soul. At the same time, the effect of deliberation upon affective consciousness is even more obvious. It takes time for one to think what one is about to do, and to make up one's mind what to do under all the circumstances. But during this time the play of feeling goes ceaselessly on; and how it goes on, in any case of deliberate volition, is a matter characterized by all the uncertainty which belongs to affective phenomena generally. For the love or the aversion with which the end was regarded at the beginning of deliberation may cool off or be pacified. Indifference may take its place; or some rival desire may spring up and eclipse it. Or, on the contrary, what was originally faint desire or latent passion may become a burning flame. Thus, we know that, if we can succeed in saying to ourselves or to one another: "Hold on"—"You may wish, and desire, and crave, but do not *will* just now"—it cannot be confidently predicted what the state of "motive" will be that immediately antedates the final deed of will. The more fierce and intensely sensuous are the desires thus held in check while we deliberate, the more uncertain in many cases is it, whether they will keep hot until the volition be formed. *Nor is this effect of deliberation manifest simply in determining what the volition will be; the volition to do the same thing, which is issued after deliberation, is not psychologically the same.*

Most important of all, however, is it to note the part which the will itself plays in every process of so-called deliberation. Such a process is, of its very nature, preëminently a volition; the rather is it a more or less systematic series of volitions under the headship of a controlling act of will. The *will to deliberate*—the volition which answers the call to "hold on," to check the immediate procedure from representative idea, or emotive condition, to a deed of positive adoption of the end—is as thoroughly characteristic of a highly developed faculty of conation as any mental activity can possibly be. And during the entire process of deliberation—whether it last but for a minute, or, at frequently renewed and prolonged intervals, for a year—volitions are constantly to be recognized as determining the resultant content of consciousness. When I deliberate, I will to attend now to this consideration and now to that, to encourage this desire at the expense of that so-called higher sentiment; or to repress the other sensuous appetency by entertaining an ethical feeling—and so on, throughout. *Psychologically considered, it is no less true that I will the influential ideas, feelings, and desires*

than that the ideas and feelings and desires influence the final "I will." Nothing can well be more shallow and misleading, in description and explanation of the facts of consciousness, as such, than to regard deliberation as a mere struggle for supremacy in consciousness of ideas and feelings and desires that strictly determine will. [But to this point we shall refer again later on.]

§ 5. Little can be added to what has already been said regarding the physiology of volition, considered as conation (p. 216 f.) or attention (p. 65 f.), regarding the psycho-physical mechanism of movement and its inhibition (p. 228 f.), or regarding the nature and origin of that "feeling of effort" (p. 221 f.) which has so conspicuously to do with all deeds of will. In all developed volitions the physiological basis of the entire mental condition includes both such centrally initiated and such peripherally originated nerve-commotions as answer to the intellective, and affective, as well as to the purely conative, factors of the complex mental state. *Volitions, even physiologically considered, are not comparable to simple sensations or feelings, whether of the muscular or of any other sort.* On the contrary, there is ample reason to suppose that the whole round of cerebral centers is hard at work when we are *deliberately* (that is, with intelligent selective attention under the influence of motives) "making up" our minds. The exhaustion and psycho-physical collapse which frequently follows choice, in the case of prolonged mental struggle and alternation of conflicting desires, is significant enough. Into no other form of psychoses does a man "put more of himself," and suffer more for it, than into such complex activities as lead up to, and terminate in, deeds of will.

At the same time the distinct and unique experience which consummates the process of deliberation, and although temporarily terminating the conflict of motives so called, often begins another process of endeavor to "carry out one's will," is quite unmistakable. To say with a recent writer:[1] "The act of will, even in its highest forms, admits of explanation as a motor process by means of the customary presuppositions of natural science without the assistance of an immaterial principle"—is a theoretical statement which we believe to be contradicted by a fair and comprehensive interpretation of all the facts of psycho-physics. But to say also, as the same writer does, that "between the mental image of the effect and its perception—*i.e.*, between the peripherally excited sensation of motion and the previously reproduced memory-image of the same—there is absolutely nothing of a psychical character;" and so to conclude that Will is nothing but "a sensation-complex bound to the sensory-motor centers of the brain;" or, "Will is a general term which serves the purpose of ethical considerations, but has absolutely nothing corresponding thereto in inner experience;" —all this is flatly to deny the plainest facts of consciousness which, *as such*, it is the very business of psychology to describe and to explain. For the distinctive and well-recognized feature of difference, when we compare the most primitive forms of impulse with the higher developments of will, is just this—*Between idea and motion something does intervene which is unique in psychical character, viz., that which we express by the words* "I WILL."

[1] Münsterberg, Die Willenshandlung, see pp. 101, 118, 122, etc.

§ 6. Those who would reduce the characteristics of volitions proper, or deeds of will, to the "feeling of effort" do not sufficiently consider the great variety of phases, so to speak, which this feeling exhibits in connection with equally unmistakable voluntary processes. As the distinctions just made remind us, we sometimes find ourselves willing with all our might to restrain ourselves from actually doing that which we desire to do, and should have done impulsively, *if* we had not willed to deliberate, or to resist desire. At other times we seem to ourselves engaged in overcoming some resistance to the movement of the bodily organs, or to the direction of attention upon the mental train toward the end desired. Such resistance may arise from what is called sluggishness of body or of mind; or it may come from the apparently inherent difficulty of the action willed. Thus we express a frequent painful experience by saying, "I can't bring myself to do this" (to spring out of bed when the hour for rising strikes; to take the cold plunge; to have the aching tooth drawn; to work out the required problem; to write the promised article; to engage in conversation with a notable bore). At another time—the next day, or perhaps no later than just as the words of despair have escaped our lips—we find that our will has rallied, and that the difficulties have disappeared or are being overcome.

But if in a large number of cases volition seems to brace us up against the "temptation" of desire, and, at the same time, to increase the feeling of effort by intensifying and prolonging the inhibition of action toward a certain end, or by engaging us in the pursuit of a certain end; in another large number of cases volition is signalized by relief from the feeling of effort. This is true — as has been said — when we voluntarily "let go" instead of continuing to "hold on;" or when we solve the doubt whether we can do a certain thing by actually starting the mechanism of motion or of attention in the process of doing it; or when, again, we settle the conflict of motives by making a choice. Apparently the physiological condition of this sense of relief which accompanies many volitions is the breaking forth of nerve-commotions from the "occupied" cerebral centers into the appropriate motor-tracts. But much of the relief —whether considered physiologically or from the point of view of consciousness—is due to the changed condition of feeling which results from the volition. For, confessedly, the strain of excited emotion and passion, especially of the "conflicting" sort, is always great. And much of the "burden" under which we feel ourselves to be when "weighing" motives is caused by our being necessarily more or less "subject" to the power of motives. Here, again, reference might be made with profit to the theory of the cerebral and psycho-physical nature of the intenser forms of feeling (comp. p. 173 f.). Other part of the sense of relief is doubtless caused by the privilege which volition often brings of ceasing from the tension of attention. The more deliberate is any deed of will—the interests involved being supposed to be equal—the greater is the required attention; and voluntary attention has been seen to be an exhausting activity.

§ 7. Finally, the reactionary effect of volition upon the various intellective processes, and its fusion with them in the total process which may properly be called the process of "willing," should be kept in mind. All the intellectual faculties, whose development has thus far been traced, are, in

their higher exercise, themselves voluntary. That is to say, we perceive, within certain not easily assignable limits, what *we will* to perceive; we remember what *we will* to remember, and think and conclude as *we determine* by volition the content and direction of our thought. The effect of voluntary attention, as a consciously directed focusing and distributing of psychic energy over the successive fields of consciousness, upon (or rather within) all these forms of intellectual faculty, has already been noted in detail. So important is this effect that some psychologists stand ready to write down the equation: Volition = Attention, in the most fundamental and comprehensive meaning of both words. A brief summary of a related view has been made as follows:[1] There exists, besides mere content of mental representation, a subjective personal activity. This is proved, in the first place, by the effect of apperception (or selective, attentive perception) on the mental image in elevating it to the point of fixation, and in reinforcing its intensity there. We have a measure for this increase of intensity in the case of those images which we voluntarily evoke in memory, and upon which we direct attention. The consciousness of this process considered as an effort of attention, and of the feelings of tension which accompany it, receives the name of "Will"—just as soon as we take into consideration the external actions which result from it.

Not only in perception and memory does volition exercise a determining influence over the resulting mental condition; in affirmative and negative judgment, also, the will expresses itself in a peculiarly impressive way. Indeed, the essence of these two kinds of judgment may be said to lie in the *fiat* and *neget* of the voluntary mind. When volition is completed, the language in which it expresses itself is the affirmative judgment—with an emphasis: "I *will* this," or the negative judgment: "I will *not* that." No matter how purely logical our thinking may seem to us to be, or how colorless, dispassionate, and strictly consequential our conclusions, certainly in all judgments relating to matters of conduct, and probably also in all scientific judgments as well, we *will* to judge what we think it fit to judge. That is to say, the more deliberate our consideration of the grounds on which the concluding thought must be seen to repose, the more deliberate our weighing of evidence, the more does the final act of "drawing" the conclusion escape the nature of a blind impulsive leap and assume the character of a deed of will. So also do men accept or reject those judgments, to which they are solicited or from which they are repelled by ethical sentiment, in the form of a volitional activity. *Thus all the faculties are welded together in their higher manifestations and developments; thus what we will is not only dependent on what we think, and what we will on what we wish, but also what we think on what we wish and will.* For the development of that so-called faculty to which we ascribe the origin of conduct is—we repeat—a most complex affair; and its deeds, the so-called volitions, imply the fusion of all the various fundamental processes of mind in the relations acquired by experience.

It is, however, the wonderful mental phenomenon (or rather complex of mental processes) which is called Choice, that most

[1] Comp. Dwelshauvers, Psychologie de l'Apperception, p. 129 f.—an attempt to summarize the theory of Wundt.

exhibits the many-sided nature of the developed Will. In order to determine most satisfactorily the "moments" which enter into this phenomenon, we must analyze our protracted condition of mind when we are most plainly and elaborately, as it were, making a choice. Here physiological theory and experimental data are of little assistance. For almost no knowledge of facts exists on which to base such a theory; and experiments have a direct bearing only on those relatively simple cases of reaction-time which show that, instead of really "choosing"—in the most peculiar meaning of that word—the subject of the experiments is only reacting impulsively under the influence of habitually associated mental images. The psychological basis for a discussion of the questions in debate between the advocates of determinism and free will has not yet been laid in experiment; it probably never will be laid, to any satisfactory extent, in work done in physiological or psycho-physical laboratories. The complex phenomena, or series of phenomena, which we call making a choice must be taken as they are given—actual data of consciousness, as such. And instead of minimizing them, and explaining them away, they are to be described, as they actually occur in the mental life, by scientific psychology; to philosophy it must be left to reconcile them with any proposed statement of a so-called "law of causation."

In the most elaborate and prolonged processes of "making a choice," the following stages, or "moments," may be discovered: (1) Mental representation of two or more ends regarded as dependent upon our action, and—usually also—of the more or less detailed courses of conduct which are regarded as means to the attainment of these ends. But since detailed mental representation of several ends and of their appropriate means cannot, on account of the limitations of consciousness, be simultaneous, it must take place by a sort of alternate dwelling upon, first one and then another of these ends. (2) Excitement of sensibility in the form of some desire or sentiment which implies appreciation of the value of the ends, and which constitutes the "motives," or affective "reasons," why either one should be chosen rather than the others. But the very nature of (1) and (2), as occurring under the most general conditions of mental life, implies (3)—deliberation, involving the estimating of the relative values of the ends, and of the risks and difficulties of their attainment, together with the excitement of a conflict of desires. [Here, however, the volitional character of the deliberation itself, with its involved regulation of the ideas by voluntary attention and its possible suppression of, or allowance of, or adoption of, certain motives,

must not be forgotton.] But into the midst of this process of deliberation there either breaks as a sort of surprise, or follows as its rational conclusion, (4) decision—or the appropriation to self of one end, and its system of means, to the exclusion of others (that psychical process which corresponds to the words "I will," as terminating deliberation; selective volition or *choice*, peculiarly so designated—what is ordinarily called "fiat of will"). It is this number (4) which is often called *the* choice; although this word is more properly used for the complex process of choosing, or making a choice, since the final decision may often be of itself considered, a unimotived volition, or even almost a blindly impulsive act. Then follows, both in the order of necessary sequence and in the order of time, (5) that more distinctly colored consciousness of doing something—"letting go," or "gripping on," with the apparatus of muscular motion and attention (what is sometimes called "executive volition," or the carrying-out of the decision).

While, however, these several stages or "moments" may be recognized in certain most elaborate deeds of will as the faculty of choosing, they are customarily more or less "huddled together," or even fused, in choices so called. Almost constantly in our daily lives alternative courses of action leading to different ends are presented before us for our choice between them. In many of these cases the mind is helped to an almost immediate and yet intelligent and genuine decision by previous experience. Is it a choice between going and not-going, between going to the place *a* or to the place *b*, between employing our time in the work *m* or spending it in the recreation *n*, between believing the report brought us, or the opinion expressed by *x* or by *y*?—it is already known, on familiar grounds, which part of each alternative to choose. Indeed, in many cases so-called choices are scarcely such to any appreciable degree; they are rather almost entirely the expression of conscious but instinctive or impulsive conative acts. For in its development Will—like all the so-called faculties or forms of mental life—comes under the principle of habit; or rather, as we have already said, here is the very seat and stronghold of the principle of habit itself.

In this "huddling together," or partial fusion, of the processes involved in choice, any one of the five "moments" may suffer more or less, both as respects the degree in which it is awakened and also as respects the time which it absorbs. Here, of course, degree of intensity and length of persistency in consciousness are intimately connected; although they may vary either directly, or inversely, or in other unpredictable

ways. Thus mental representation of the ends, between which choice is to be made, may be clear and comprehensive from the very beginning of the process of making the choice; and in this case deliberation consists in estimating the affective values of the two, or in being swayed by alternating waves of desire that move in different directions. In other cases, however, the very pause before decision and the entire process of deliberation may be due to the fact that a demand is made to know more definitely "what we are going into," before making a decision; and now when knowledge is gained, the decision follows as a matter of course. In still other cases the excitement of sensibility and the motivation which desire furnishes, make comparatively little show in the complex process of choice. This may happen either through lack of intensity to the feeling, or because the time through which deliberation ranges is too short for desire —to speak figuratively—to get a firm hold on will. For there is such a thing even as very deliberate, intelligent, and yet unfeeling, choice. Yet again, the "strong desire eclipses the aim," and shortens up the entire process of deliberation, bringing it to a decision before either knowledge of ends and consequences, or higher sentiments, have had a chance greatly to influence the process. In calling attention to these differences the same truths appear as those which characterize the nature of all volition; but the peculiarity of choice consists in just this preparatory vacillation of attention between ends, and in the corresponding shorter or longer, fainter or more intense, conflict of affective states.

It is the Decision or "cutting-short" of the process of deliberation, in which will expresses itself as the faculty distinctive in all making of choices. But will also expresses itself—so we have repeatedly been compelled to notice—in the process of deliberation all through. Yet the decision is the very acme of the activity of will, the triumph of developed conation over sensation, feeling, and desire, with their impulsive and instinctive powers. This central activity of Will is also called "determination" or "resolution;" and by these words it is indicated that the period of vacillation of intellect between ends, and of desires considered as appetencies prophetic of possible volitions, is *terminated;* that which was a question, a problem, is now settled or *resolved.* In its own nature, however, considered as isolated by a fictitious analysis from the complex presiding intellective and affective processes, decision does not differ from volition in general. Not infrequently decisions, following upon long and painstaking deliberation, are made in an impulsive, and almost or quite invol-

untary, way. The intellectual, æsthetical, and ethical quality of the decision depends, then—psychologically considered—upon the character of the intellective and affective processes in the midst of which it is set. This is only to say that intelligent, admirable, and morally right decisions must be made in view of consciously represented ends, and as motived by correct æsthetical and ethical sentiments.

§ 8. The various attempts of physiological and experimental psychology to sophisticate the facts of consciousness instead of faithfully describing and cautiously explaining them, are nowhere else more unbecoming than in the phenomena of choice. There are, indeed, certain reasonable conjectures as to the probable condition of the brain while the psychical phenomenon of making a choice is going on. In general, this may be described as a state of tension in which alternating depression and heightening of nerve-commotion takes place in the various cerebral centers that have control of the mechanism of motion and of the innervation of the sense-organs. This state of tension comes to an end when, with the decision, some definite direction is given to the neural excitement and it is "drawn off," or discharged, into the connected nerve-tracts. In this way the feeling of effort, the feeling of exhaustion and strain, the feeling of relief, etc., which accompany the different phases of deliberate choice, are explained physiologically as having both a central and a peripheral origin. But all this is far enough from explaining, and farther yet from *explaining away*, the more important psychical processes which enter into this unique act of will. There are such mental activities as we can express in no other language than some such as the following: *I* "hold on" before deciding; *I* voluntarily consider and estimate the value of the ends proposed; *I* suppress this desire, and encourage or adopt another, or decide by a preliminary volition to be guided by such an æsthetical or ethical sentiment; and, finally, *I* decide for this end and its involved course of action, rather than that. When, then, a writer—like M. Luys[1] for example—asserts that all this psychical process is illusory, and that the object chosen is "only forced on us by the cunning conjurer, the brain," because "the cell-territory where that object resides has been previously set vibrating in the brain," he is not explaining but rather contradicting the facts of consciousness, as such, on the basis of a purely mythical physiology of the cerebral centers. And in no sphere of so-called science is unadulterated myth-making more easy, fascinating, and yet dangerous, than in cerebral physiology.

Little better—if, indeed, they are at all an improvement—are the conclusions of Münsterberg and others, as placed upon an alleged basis of experimental psychology (p. 619). Experiments in reaction-time, have, indeed, established, with a fair amount of conclusiveness, an answer to this question: "About how long does it take, under given circumstances, to set free a voluntary impulse?" The first experimenter (Donders) answered this question with the number 36 σ. Later experiments (by Merkel) made the time required to "set free" the cerebral processes involved in a very simple choice be-

[1] The Brain and its Functions, p. 264 f.

tween two possible courses of action (*e.g.*, to react with one finger rather than another) vary from 24 σ to 155 σ. To choose one of the ten fingers with which to react, required "will-time" of 298–448 σ. As might be expected, it was found that by establishing fixed associations between certain perceptions and their assigned modes of reaction, the will-time could be greatly reduced or even wholly eliminated. The data brought out by still subsequent experiments in "question-answer" associations have already been mentioned (p. 303). By all this elaborate experimentation, however, nothing has been shown that changes our estimate of the unique psychical character of choice as a conscious activity, nothing that was not perfectly familiar before; namely, that deliberation takes time, and the more of it, the more time; that actions which, to begin with, require time for choice may become, by even a little practice, almost or quite impulsive; that there are many questions of apparent choice, about which our minds are already made up, or which we answer impulsively, etc. But, here again, to explain, or to explain away, the complex and subtile psychoses that are emphasized by these highest transactions of developed Will, in the name of such experimental psychology, is a quite unwarrantable procedure. Indeed, it can scarcely be too emphatically said: *There is not a fact known to physiological or experimental psychology that makes any less unique, mysterious, and impressive, but necessary, that assumption of inexplicable spontaneity, of self-activity determinative of following psychoses and bodily movements which belongs to the consciousness of making a deliberate choice.*

§ 9. The complexity and length of the mental processes involved in all genuine choices may be said to be invariably "fore-shortened" in our memory of the choices themselves. In all cases of elaborate choice it is the *decision*, and not the preceding deliberation, which is of chief psychological and practical interest. And, indeed, how the decision was reached may be beyond the possibility of recall; may even never have come, with any approach to entirety, into consciousness so as to fix itself in memory. Moreover, the entire development of mental life requires that a large number of our choices, while retaining their character as choices, shall be made either as guided by established principles of action or by that quick leap to judgment which we call intuition or tact. It is in this way indeed, that many of the most notable and heroic choices are made—whether the life of the individual or the history of the race be considered. For example, it is sufficient to note how the swimmer proceeds who makes it his choice to attempt the rescue of a drowning person; how he selects the means of assisting himself that are at hand, or can be ordered, and the manner of handling his burden in the water, and of reaching shore or the ship's side again; or how the locomotive engineer, on seeing an obstruction on the track, chooses whether to shut off, or to let on more steam, and chooses the time to jump through the cab's window, etc. All such deeds of will, although the time of deliberation, with its mingling of voluntary attention, of ratiocination, and ferment of affective influences, is short, cannot properly be called impulsive or instinctive; they are rather genuine choices. The wonderful mingling of grasp upon the situation, pressure of feeling, and promptness of decision, which characterizes them, properly excites both æsthetical admiration and moral approbation. And men who can habitually choose in this way are often not only "men of

decision," but men of that clearness of intelligence and strength of feeling which is as far as possible removed from rashness or the relatively unintelligent and *non*-moral character of merely impulsive action.

While, on the one hand, the word choice should not be limited to those deeds of will where prolonged deliberation over two possible ends precedes, on the other hand, it should, of course, include the unimportant as well as the most significant deeds of will. Choice is something constantly going on in the development of mental life. Figuratively speaking, we may say that the path to be followed in this development is, at every moment, an open question. So far as either observation of others or of our own self-consciousness gives us the data, we are compelled to affirm: In every stream of consciousness, which we call a "mind," there is constantly an unsolved problem occurring. The decision or resolution, which is the essentially conative act—this alone actually solves each such problem. That is to say, there is an almost ceaseless mental representation of two or more possible courses, with their appropriate affective accompaniments—of an *a* or *b* or *c*, as possible of realization by the ego; either *a* or *b* or *c* *must* be realized; it is antecedently much more *probable* that *a* will be realized (or that *b* will be, etc.); *but only the decision decides, only the resolution resolves the problem.* When attention is called to this aspect of all mental development, as dependent upon choice, it only sets forth the most obvious of facts—however the metaphysics of physics or of psychology may be disposed to regard the ultimate significance of the facts. Scientific psychology cannot give a faithful picture of soul-life, and of its development, without emphasizing this unique phenomenon, or rather complex of phenomena, called "making a choice."

§ 10. Although, then, it does not belong to psychology, as we are pursuing it, to refute, or even to consider the arguments of determinism, or the theory of a complete causal connection, whether between the decision and the desire, or between the psychical process of choice and the physiology of the cerebral centers, a protest may properly be entered against the way in which the deterministic arguments are customarily presented. In this matter there are few more unpardonable "sinners" than Höffding[1] has—in his generally fair and always interesting book—allowed himself to become. "Psychology," says this author, "like every other science, must be deterministic; that is to say, it must start from the assumption that the causal law holds good even in the life of the will, just as this law is assumed to be valid for the remaining life and for material nature." Such an assertion as this may properly be met with the flattest kind of denial. Psychology has absolutely no right to make any such assumption. Psychology must first of all faithfully describe, and then, as far as possible, explain (and never explain away) the facts of consciousness, as such. Among these facts it finds the complex phenomenon of choice. And this phenomenon certainly *does not look like* a phenomenon to be explained off-hand as it were, by assuming that the causal law is valid for it throughout; "just as this law is assumed to be valid for material nature." On the contrary, no one can deny that choice "looks like" a phenomenon the very opposite of such a natural phenomenon. To test this let any one, in an unprejudiced way, consider, what goes

[1] Outlines of Psychology, p. 345 f.

on in his own consciousness when a choice is being made. Let him particularly mark the fact that every rise and fall of the ideas of the ends, and every increase and decrease in the so-called influence of the motives, is itself a matter largely dependent upon the same apparent spontaneity of conation; while the decision, as such, is a sort of apotheosis of such apparent spontaneity. Let him remember that the primary obligation of psychology is to remain true to the facts of consciousness, as such; and then he may feel the more confident that psychology, instead of "assuming" determinism to be true, must turn the question of its truth or falsehood over to philosophy. But *even this it will do with a strong inclination against the deterministic doctrine, an inclination legitimately based upon the indubitable character in consciousness of the phenomenon we call "making a choice."*

By such words as "Plan" and "Purpose" certain activities of Will are emphasized, that are of even more comprehensive and indirect relations to conduct than are so-called choices. And by the terms "self-control" and "courses of conduct," the relation of subordination is indicated in which many individual volitions, whether unimotived or genuine choices, stand to these plans and purposes. *Properly speaking, every genuine volition and—even more obviously—every choice, is planful or purposeful.* In its very nature, as has already been shown (p. 618 f.), the deed of will determines or organizes, in the direction of a certain end, a system of psychic activities, intellective, affective, and motor. But deeds of will admit of being arranged in a series of hierarchies, as it were. Some of them rule only momentarily and by way of limited monarchy over the psychic train and the motor consciousness. Others of them extend their influence over years of time, or even over the whole of life and its complex of experiences; and this they do in a more or less nearly absolute way. In such cases there is always left abundant room for that elasticity and apparent spontaneity of the individual choices to which reference has just been made. For even when the stream of consciousness is intelligently and voluntarily directed toward a certain goal, or deliberately turned aside by a well-calculated curve, there is the same possibility of either *a* or *b* or *c* being the subordinate end, or the means, chosen at every minute subdivision of that curve.

Plans and purposes—considered as formed by different wills, or by the same will under different conditions, or at different stages of mental development—differ in the following among other particulars: (1) Both the end proposed, and the means necessary to its realization, may be more or less comprehensive in themselves, and clearly and steadily held before the mind by mental representation. (2) Steadiness or firmness of will ("the very backbone of what we call will"—Sully), or its opposite, is

characteristic of plans and purposes more obvi
volitions or choices. (3) These comprehensive de
reciprocally related to the control of the "Self"-
feelings, and habits of action. In other words, wh
duct is determined by plans; and plans are thems
or even determined by experiencing the results o
In this way a man's plans—as respects the end
means employed, the relation of thought and feeli
them,—are indicative of, and co-extensive with,
When it is said of a man, "he changes his purpo
and causelessly;" or, "he has no fixed plans;" or,
cording to such a plan"—it is understood as defin
of a man he is.

The formation and adoption of plans is a matte
the former having, however, the characteristics ra
eration and the latter of decision; yet in both f
adoption the act of will is obviously involved. He
mination of will is much more *interior* than where tl
of volition and choice in external action is imme
forming of plans, "I will" to think out the pro
quences of my future bodily movements or of other
"doing;" to elaborate certain ideas of ends to be
of means to be employed; to anticipate feelings of
another, on my own part and on the part of other
is, in brief, by a choice that is overruling I volun
attention into certain channels of cognitive mem
tive imagination, and logical conclusion. Such a
undoubtedly results in innervating certain cerel
rather than others, and, to a certain extent, thei
organs of sense; but it is inhibitory of, rather tha
of, obvious bodily movements. So also in the deed o
adopts the plan I do not necessarily set agoing b
will any easily marked train of associated bodily
Some plan has, indeed, been adopted by the choice,
ecution may not begin immediately; it may not ev
templated for a considerable time to come. Thus
observable motor result of a most comprehensive
decided upon, may be only the saying to one's self (p
under the breath, yet still with an internal emphasis):
will do,"—that is, when the time comes, and as often a
again and again, for the contemplated series of act
this "will" is not merely the future tense of "to be;"
a highly organized volition, a choice of a plan which
stands to the *ego* in a peculiar relation.

§ 11. The planful, purposeful, character of all volitions and choices—in the most general meaning of the words "plan" and "purpose"—has already been noted in considering the conscious teleology which belongs to developed will. For example, if I choose to draw a circle rather than a triangle, or to run a line from *A* to *B* rather than from *A* to *C*, in the attempt to solve a geometrical problem, my choice operates as a controlling plan over the succeeding movements. So also, if I choose to walk to the station by the way of the post-office rather than to take the street-car there from the next corner; or choose to eat an apple rather than a peach, from the dish of fruit offered to me. Even those simple unimotived volitions, which approach the character of the more purely impulsive or instinctive activities, in so far as they are genuine volitions at all, may be said to involve the formation of a plan. Choice of a plan, indeed, may be said to be involved, as a sequence, in certain unimotived volitions. For not infrequently the one thing willed, as the only end before the mind, may be accomplished in either one of several ways. Thus a skilled fencer who has willed to attack his opponent at what he knows to be his only weak point, and under the influence of this volition is watching his opportunity, may with incredible speed, and yet with conscious intelligent choice, select the particular form of giving his thrust—some new trick he has recently learned.

In the more restricted use which is here made of the words plan and purpose, however, emphasis is laid upon the more deliberate and comprehensive choices whose execution is reserved for the future. Into such a supreme manifestation of will all the highest development of the entire mental life may enter, as making contributions to its character. To plan, to purpose, in this meaning of the words, is to exercise all the faculties of developed manhood, under the control of will. Yet this, like all other complex manifestations of those faculties, is also matter of degrees. We should not, therefore, by any means confine our estimate of such products of will to those who can say with the Paracelsus of Browning:

> "I have subdued my life to the one purpose
> Whereto I ordained it;"

or, again:

> "I have made my life consist of one idea,"

however grand the idea and noble the sentiment belonging to the plan. The lower order of savages, and the average man of the civilized community, do indeed suffer themselves to be swayed by internal passions and external circumstances rather than "subdue" their lives to any "one purpose." And yet there is another side to all this. They, too, as sharers in the possibilities of human development, habitually take large sections, as it were, of their own lives into their own keeping; they "ordain" them to some *one* purpose (though it may be no nobler purpose than to take vengeance on an enemy, to excel in trapping game, or in outdressing and outranking others, or in "bulling" or "bearing" the market); and they subdue ideas and feelings and minor volitions to this one purpose. They thus rise above the lower animals and show the leading characteristics of a distinctively human de-

velopment, by the kind and amount of imagination, thought, and feeling, which they rally under the deed of will, in the formation, adoption, and execution, of some plan.

§ 12. As to the execution of plans, it should be noticed that this, as a rule, takes place in part by means of impulsive and habitual, or perhaps purely reflex activity; and in part as a matter of consciously ordered conduct according to the plan already formed. This is true, however comprehensive the plan may be. If it be only to draw a certain line or figure, or to go in a certain direction; or if it be one of those plans to which the whole life is "ordained" and "subdued"—the unconscious and the conscious together share the responsibility for the execution of the plan. For example, let us analyze all that the savage does in execution of his purpose to hit with his poisoned arrow just that particular man among the opposite hosts of the enemy whom he has selected for this purpose; the series of transactions, from the picking out of the arrow to the lifting of the fingers to let it fly, will involve the whole realm of unconscious reflex and automatic activities, as well as the conscious guidance, by sight, touch, and muscular sense, of the conduct—rallied and "backed up" continuously by resolution of will. In every man's daily life of work, or play, most of what he does is in like manner capable of being considered as, to a large extent, the execution of plans formed previously—it may be, long before. For what I have already willed shall be the ends of my conduct steadies and determines what I think, feel, and will, hour by hour—sometimes controlling in a largely or wholly latent way, and sometimes tinging the mental life through and through with conscious resolution. Thus the workman works, the artist sings or paints or composes, the scholar studies and lectures, the soldier marches and fights and bivouacs, the lawyer pleads, the minister preaches, the lover pursues his suit, and the mother manages her household; thus also, in large measure, does the pleasure-seeker amuse himself, the criminal commit crime; and only the hopeless idiot manifests no manner of "will to live" in some definite and chosen, rather than some other way. And when we think out the import of what has just been said, we obtain additional reasons for *recognizing the very important distinction between wishes, or cravings, or desires, and planful deeds of will.*

§ 13. The interior and unexpressed character of one's Will in the formation and adoption of plans has a marked influence over the psycho-physical and muscular mechanism. In doing planful work I seem to concentrate all my voluntary attention on what goes on within myself: nay, more—*upon taking charge of what goes on within myself.* I *will* bend consciousness to my will; I *will* make my imagination and my thought put into shape for me some end, together with the means for its realization, which I may adopt for my own. Physiologically considered, these states show a suspension of the more obvious motor accompaniments of volition. And so we read: "*Sits fixed* in thought the mighty Stagirite." Thus our attention is called to the fact that in planning men are apt to inhibit external movements; as thought deepens, if they have been walking, they not infrequently stop and stand still while they plan. Not only the muscles but also the external sense-organs cease to be innervated. While thus engaged in planning we neither see, nor hear, nor feel; distinct and most irritating emotions are apt to fol-

low on our being aroused from this condition by demands to turn our attention outward again.

Yet even in the most extreme cases we are not warranted in assuming that all motor accompaniment of volition is suspended. On the contrary, the true expressive motor accompaniment of the higher activities of imagination and thought is then likely to be particularly emphasized. The state of conscious and detailed planning is one in which we are "reasoning with" ourselves and "talking to" ourselves; and the language employed is not only in its character but also in the manner of its interior utterance, colored strongly with the currents of conscious thought and feeling. When, moreover, we are adopting a plan, we are inclined actually to bring down our fist, or to set our foot hard upon the ground—thus giving expression to a finished comprehensive resolution. All these and other evidences indicate that *the intimate connection between conation and motor consciousness, and between psychoses of a markedly volitional order and the tensions and movements of the muscular mechanism, is by no means broken in the case of the higher manifestations of planful will.*

All the foregoing statements hold of those purposes which control the trains of thought, or the arrangement of our ideas, in the search after truth or in the production of works of art. Here the quest for mental images and logical conclusions, or for the happy and fit expression of them—the right word or phrase, the suggestive turn, the apt metaphor, etc.—is taken in hand, as it were, by the will. But the execution of any such plan is always very largely a matter of the unconscious or largely impulsive working of the psycho-physical mechanism. This is felt to be true by the subject of the willing, himself. Hence we hear much in all such cases of the influence of suggestion, of flashes of imagination and leaps of logic—all of which seem like contributions from the unconscious to the execution of the conscious plan. On the other hand, those who have not these helps cannot by willing, however persistently and intensely, obtain either the material or the arrangement necessary for such a plan. In illustration we may recall the humorous picture in one of Fritz Reuter's novels, of the worthy dame who undertook to write poetry as a mere "deed of will:" "Here I sit and sweat, and bring nothing to pass."

It is further interesting to notice how certain plans—such as those which the general actually follows in an engagement, or the musician in improvising or composing, or the orator in speaking impromptu, or the thinker while pursuing and yet guiding his own thoughts—are progressively formed, adopted, and realized. Here general ideas, quite vague as to outlines and details, may be consciously adopted by the will; and the planful character of the resulting activity is itself a sort of growth in which all the factors of unconscious and conscious life are combined. So splendid and unexpected are sometimes the results thus realized that an impression is made as of another Will, and another thinking, feeling Mind, than our own, welling up in the stream of our conscious existence.

We have already, in part, passed in review those phenomena of consciousness in which the disputed question of the Freedom of Will has its rise. It has also been declared that this ques-

tion, for its profounder and final consideration, must be handed over from psychology to philosophy. More precisely, it is the relations in which the conclusions drawn from the mental phenomena stand to the so-called law of causation that need adjustment by the more ultimate reflective treatment which philosophy gives. But while descriptive and explanatory psychology cannot perform the office of philosophy, on the other hand, a crude metaphysics cannot properly embody itself in some uncritical statement of the law of causation, and then in the name of this "law," explain away the phenomena of consciousness. Moreover, psychologically considered, the law of causation itself arises from the projection of the principle of sufficient reason upon the world of things—the demand which the intellect makes upon itself to keep on trying to explain. If this were the place it could be shown that most of the arguments for what is customarily called Determinism arise from unwarrantable ways of stating and applying this so-called law of causation; it could also be shown that most of the objections to a full recognition of the obvious meaning of phenomenal free-will arise in the same way.

In a work on descriptive psychology, however, it is in place only to attempt these two things: (1) To state those more obvious aspects of volitional conditions and acts which constitute the consciousness of "being free" in the widest sense of these words; and (2) to make such inferences as seem to arise directly from the facts, without entering upon the attempt to estimate man's place in nature, or the propriety of applying to consciousness the law of causation, or the relations of body and mind; or to answer other ulterior questions of a similar kind. But two or three preliminary remarks are important; and these remarks must constantly be borne in mind. First, the phrase "freedom of will" is an abstract term, to use which in its customary meaning is contrary to the spirit of all our previous psychological discussion. The term in itself seems to imply that some separable entity, or at least separable faculty, called "Will," exists, and that *to it* alone the quality, or predicate, of "being free" applies. But to put the question with the concreteness which scientific psychology demands and which corresponds to actual experience, it is this: Do *I* will freely? and, What do I mean by the word *freedom* as applied to myself when I *will*? And here at once we see that the entire course of our previous examination provides a partial answer. My willing, like all my action, nay—like my being a Self at all, is a development. I come, then, to will freely, only under certain conditions and as a result of development. And further what I mean by willing freely is (*A*)

that I am not compelled by any force, external to consciousness, to the deed of will; on the contrary, it is *my* deed of will. I have—as is ordinarily said—"freedom from compulsion." But plainly I mean something more than this when I affirm all that I know and believe when I say: *I will.* I mean to express (*B*) the conviction that no condition of consciousness—no idea, or emotion, or desire—regarded as external to the deed of will, compels me to will. This amounts to saying that men generally do *not* make the assumption which Höffding, as already quoted (p. 627), says the psychologist must make—namely, that "the causal law holds good for the will as for material nature." On the contrary, the general conviction is that the deed is entitled to be called my "*will*"—whatever may be my desire, or wish, or thought—because it is *not* connected with any other event in consciousness, as physical science assumes events in material nature to be connected. And history further shows us that the naïve assumption attributes free will to nature rather than causal law, as modern science assumes it to exist for material nature, to human free will.

But, second, no deed of will, however free it may be conceived of as being, is an isolated or unrelated psychosis. Every deed of will has content; it is will—to some particular end. It is generally, if not always, motived by some excitement of feeling, some interest in some good to be gained. If we recognize as genuine deeds of will at all those random, automatic, and unimotived psychical forthputtings, which appear to arise in consciousness, they are of all others least worthy to be called free. And to try even to frame the conception of myself as willing freely, without also willing intelligently and feelingly, is to try to think of myself as a machine and not as a free will. Moreover, the very thing that the development of mental life most demands is the possibility of adopting, by acts of will, progressively higher and more comprehensive ends, and nobler and purer sentiments.

Yet, again, no "consciousness of freedom" in the sense of an immediate awareness that the law of causation does *not* apply to so-called deeds of will is, of course, possible. To substantiate a claim to *such* consciousness of freedom, one must first formulate the universal consciousness corresponding to the law of causation; and this is something for which an appeal to immediate consciousness is utterly inadequate. It has already been said, however, that *the conviction "I freely will" is equivalent to a denial of the belief that any influence, even from my own desires, compels me to will.* In fine, then, developed Will seems

to bring us around again to that limit to all scientific explanation which we find fixed, in physiology, by the mysterious automatism of the central organs, and, in consciousness, by the self-activity which the conative aspect of consciousness, by virtue of its very nature, displays. And no reliance on the law of causation takes us beyond this limit. Indeed, by following this law faithfully we are led to the candid recognition of these ultimate facts; all scientific explanation ends in the unexplained.

Those who argue for, and those who argue against, the deterministic position by an appeal to immediate, uncriticised data of consciousness, are, therefore, alike thrown out of court. Psychology must be left unprejudiced to determine what is meant by the consciousness of freedom; and this it must do by analyzing that peculiar complex of feeling, thinking, and conation, of which we become immediately cognizant when we direct attention to certain unique states of our conscious life, called "willing," in the highest sense of the word. The "highest sense" of the words "I will" (or "*I* choose," "*I* plan," "*I* make up my mind," etc.) is that which most emphasizes the unique characteristics of this same complex psychosis. And now, once more, we will briefly review what those characteristics are.

§ 14. In willing we attain (1) the highest consciousness of self-activity. In all such experiences the obvious fact is: I know myself as the one that wills—that "does something," rather than as the one that suffers some affective excitement or receives some presentative or representative impression. This consciousness is tinged with the conviction, derived from my knowledge of self, that, while I can deny or reject my desire for having surprised and overcome me, on my willing my "Ego" has "stamped itself" with a conclusive signature.[1] This is a figurative way of saying, when I regard a deed of will as such, I regard it as in a peculiar meaning of the words, *my own*. Willing is thus distinguished from mere desire, which is also the consciousness of striving after somewhat regarded as at present external to the Self, by having in appearance a deeper and wider interior origin. To represent this unique experience of willing as merely the consciousness *of* the triumph of one of several cerebral processes contesting the supremacy of the sensory-motor mechanism, or as merely the consciousness *of* the stronger of several muscular sensations, or *of* the prevalent ideation-processes, or *of* the more potent desire, is to sophisticate consciousness instead of faithfully describing or satisfactorily explaining it.

The consciousness of freely willing manifests itself especially when we consider (2) the appropriate activities in their more pronounced and highly developed form, from two points of view. When after deliberation,

[1] Comp. Volkmann: Lehrbuch d. Psychologie, II., p. 459 f.

and previous to final decision, I stand in the position of a contemplator of my own future deed of will, my conviction with reference to it is expressed by the words: "I can." To this "I can," which has reference to the alternatives involved in the choice, I may prefix the words "I know;" and my total conviction is then expressed by the words, "I know that I can"—*i.e.*, decide for *a*, or *b*, or *c*, as I will. Here the word "*know*," as we have already shown, is not equivalent to a philosophical knowledge of the exemption of the deed of will from the law of causation, however that law may be stated. It simply expresses, as belonging to that compound of thinking and feeling (including belief) which we call self-knowledge, the conviction, I can really choose; the choice to be made is now potentially mine, and will, when made, be imputable to me.

Yet again, when, in the light of consequences, both external and internal (the excitement of sensuous and æsthetical and ethical feeling—as of regret, shame, remorse, etc.) I review the deed of will, I reaffirm it to be mine. If the doing was mere doing, and did not arise in consequence of my willing, then my judgment and conviction may be expressed by the words: "I could not have done otherwise," and so am not to blame, or do not feel shame, etc. But in the degree in which I recognize the doing as genuine deed of willing —*my own doing*, in the unique sense—I say: "I could have," but "did not," etc. That such a contemplative attitude toward my own willing, as regarded from these two points of view, produces the consciousness which expresses itself in ways like the foregoing, there can be no doubt. The conviction of potentiality thus arising is an important part of the "consciousness of freedom."

Such "consciousness of freedom" as is peculiar to willing may (3) suffuse all the activity of our developed faculties; for, as has been maintained from the beginning, will is no isolated entity or separable faculty. Really, then, we may say that all exercise of faculty is capable of being free, in so far as it may be influenced by, or penetrated with, the willing mind. In other words, it is the universal presence, in all developed conscious life, of the conative aspect of consciousness, on which we direct attention when we become aware of our freedom. Just here, however, no mistake should be made. To illustrate: We find one author[1] maintaining that freedom = spontaneity of thinking. Another writer[2] gives it as his opinion that, instead of assigning all freedom to the will, there is a freedom of the soul in all our doing; and that the soul produces the ideas as they are without any need of a special Will. Now this freedom of the soul in the control (not in the production) of the ideas *is*, indeed, will, in one of its many particular forms of manifestation. But "freedom = spontaneity of thinking" is not the equivalent of freedom of will. In dream-life and reverie, as well as in conditions of exalted productive and artistic activity of imagination and intellect, we enjoy or suffer from a wonderful spontaneity of thinking. In its extreme form such spontaneity may become a condition of consciousness where freedom of *will* is not exemplified, but overthrown. So-called inspiration and mania are examples of this sort. In *such* spontaneity of thinking, the impression made upon us by the tone of our whole consciousness is that

[1] Horwicz: Psychologische Analysen, ii., p. 181 f.
[2] Lipps: Grundtatsachen d. Seelenlebens, pp. 15 f., 45 f., 653 f.

of being "carried away" by our own ideas or feelings ourselves being in control of our ideas and feelings. Tl of this marked difference in the two kinds of consciou those which distinguish willing from the mere having of So then the freedom = mere spontaneity of thinking is will; but, on the other hand, my spontaneity in controlli one exhibition of my freedom of will.

In connection with the consciousness of freedom, by the development of æsthetical and ethical sentiments, conceptions of "imputability" and "responsibility" are g ceptions, when analyzed, are shown to imply that exter pendent upon willing, and that willing is preëminently tl wills. If then the doing (or the refraining from doing; check inclination, or to will not to do, is also a true act the regular and expected way upon the willing, the judg doing to the willing agent is invariably made. Its formul ness of the willing agent is: "I myself have done it." Fo for the doing which thus follows upon the willing (the c plan, and also the regular, expected consequences in ext who wills is held responsible. As to the ultimate ground this feeling and judgment of imputability, and as to degr ity, ethics and metaphysics, rather than descriptive psyc ested to investigate.

The consciousness of freedom in willing is further cases in which, as we are accustomed to say, such freedo lost. Here all our habitual expressions and formulas of nificant of an opposite tone of thought, feeling, and convi the nature of our own consciousness. We now say: "I wholly, or at all) *my* fault" ("The woman . . . tempt eat"—where the external deed is acknowledged, but not from free will), or "I can not, or could not, do otherwise;"— which covers all degrees of the invasion of will, so to sp forms of external compulsion, and by strong, impulsively ac "overpowering passion," from within. All such phrases a biguous in meaning and relative in application to the gre ditions under which the intellective, affective, and truly co consciousness get recognition. Indeed, these same phrase press the most deliberate and firm resolutions of will, in vie and backed by the most worthy of æsthetical sentiments ("God help me; I cannot do otherwise").

Similar phases of consciousness in willing are illustr classes of abnormal phenomena: Such are the cases of pers tions and *idées fixes*, where the perceptions and imaginatio as "too strong" to be corrected or inhibited and controlled tention and ratiocination. Whenever this impotency of will is presumed to rest upon a basis of physical and organic dera be called a "disease of will." The opium-eater and user of excess, the kleptomaniac or victim of other intense passion subject of the hypnotic trance, the morbidly nerveless and d

ers from pathological conditions of will. So far, however, as psychology is concerned, all such phenomena, instead of justifying the denial of the content and import of the consciousness of freedom, only serve by contrast to make plainer its unique and unmistakable character.

§ 15. The more immediate inferences from our study of the phenomena of developed will are not particularly difficult to make. The "will-aspect" of all mental life and mental development brings us face to face with the most mysterious and interior nature of the so-called Self. In some sort "I" and "my will" stand related as so-called Ego and no other so-called faculty (than will) stand related. It is here, and not through the enforced synthesis of sensations and their representative images under the laws of association, that the deepest root for the unity of mental life and mental development is found. *Descriptive and explanatory psychology thus brings us to the place where we have to acknowledge that, not something external to consciousness, but something manifesting itself in consciousness, contains the secret of the kind of life the phenomena are, of the course of the development which actually takes place.* Considered on its every side—passive and active, intellective or affective or conative—we call this something, "the Mind," or "the Soul." But considered on its seemingly self-active side—considered as shaping itself to chosen ends, controlling its own manifestation and marking out the course of its own development—we call this something, "the Will." Were there not this side of mental life and of mental development, the stream of consciousness would be fit to be regarded as forever definitely marked out by its surrounding banks. But this side, so palpably real and so obviously unfit to be explained in such external fashion, compels us to take another view of mental life and of mental development. It compels us to recognize a unique and self-active being as—within limits, to be sure, and often indeed narrow limits—interiorly determining, in a quite inexplicable way, its own course. We say "inexplicable" way—that is, so far as scientific psychology is concerned; it is for philosophy to say how far this self-determining activity is ultimately explicable, not to say permissible to reflective thought.

It would be easy enough, but would take us too far one side, to show how this unique consciousness of freedom is most intimately related to all mental development. On it very largely depends the development of the knowledge of Self, and indeed of the knowledge of Things. All high æsthetical and ethical development is connected therewith. And, indeed, the inferential and scientific knowledge of the world as concatenated phenomena, expressive of "forces," and "potencies," and "natures" of various kinds, is largely dependent upon this same consciousness of freedom.

The word Character—although somewhat loosely used—has two tolerably well-marked meanings, one wider and one narrower. In the wider meaning of the word we understand by the character of any individual the whole complex of his mental activities, and indeed passivities, as compared with some recognized standard. When characterizing the individual in this way we have to say what amounts and kinds of sensations, perceptions, acts of imagination and thought, what feelings and desires,

choices, purposes, and plans, and especially habitual modes of external behavior, serve to mark off this individual from others by application of some measure common to all. In such a meaning of the word, one's character is equivalent to one's individuality—the whole that one is, as a distinct member of the species man. We shall have something to say of certain points involved in this use of the word—under such heads as "temperament," "disposition" "habit," etc.—in the following chapter. In the narrower and more precise meaning of the word, however, *Character* is preëminently a matter of the Will, and of its customary modes of behavior, and of its development. Thus "my character" is for every man what "I am"—not as formed at the beginning according to the mould of an inherited nature, nor as merely passively shaped by an environment. Character implies, to be sure, being "stamped" (Greek χαρακτήρ = mark, or stamp); and without the formation of fixed habits, of modes of behavior that admit of being characterized, or stamped as belonging to a certain kind, no character is possible of attainment. Nevertheless the word implies such stamping as the agent is thought chiefly to give himself; and the habits which enter into our character are regarded not so much as having and holding us in certain directions of conduct, but rather as expressing those lines of conduct in which we make ourselves to go, or hold ourselves against the motives to forsake them for other paths.

Formation of Character in this sense of the words implies the self-formed habit of Will. It is above all the stamp which the agent gives himself by habitually choosing and holding to certain ends; and then by bringing "to heel" all the content of consciousness, and all the service of the psycho-physical mechanism, in the progressive realization of the chosen ends. Or to carry the distinction further; so far as I have, or am, a certain *nature* or disposition, this has been formed *for* me, by the necessary reaction of consciousness upon the excitements to which my organism has been subjected by its environment, in the larger sense of the latter word. But so far as I have, or am, a certain *character*, this is to be regarded as progressively formed both for myself and *by* myself; from the points of view of imputability, or responsibility, it comprises so much of what I am as I have contributed, and am therefore holden for.

Two modifying remarks, however, immediately suggest themselves: (1) It is never practically possible to make a satisfactory separation between what belongs, and what does not belong, to character, in this narrower meaning of the word. Upon the at-

tempt at such separation, systems in ethics, dogmas in theology, and even principles and laws in social and political life, have staked their right to existence; and have been obliged, when leaning hard upon the distinction, to fall. For the impossibility of practically carrying out this distinction depends upon the entire nature of psychical being and psychical development. From the start, our nature is far too complex, and our development too subtly continuous, to allow of such an attempt being successful. (2) But no less the theoretical recognition of the distinction obliges us at once to emphasize the immense complexity of character, in even this narrower meaning of the word. For will itself has already been seen to involve in its development the most complex related activity of all the other faculties. Will in itself, bare will, cannot develop, cannot see to do any particular thing, cannot estimate or feel the value of any particular deed or course of conduct, cannot choose any definite end in preference to another end. So that, character as willed cannot be estimated or characterized, without taking knowledge and feeling, as well as conation, into the account. Self-formed character, then, involves all the shaping which I have given to my own intellectual and emotional life. Nay: especially does it involve and depend upon the principles intelligently accepted, and the emotions and sentiments selected and controlled—the chosen ends and motives—according to which I habitually act. In saying this it is implied, on the one hand, that *blind* will is no *Will* (psychologically speaking, whatever may be philosophically true); and also, on the other hand, that *ends* mentally represented and *motives* consciously felt, *must be willed* and followed as principles, *in order that they may enter into character*—in the more precise meaning of the latter word.

Character is then, in both meanings of the word, a sort of resultant of two different (and almost opposed) sides of mental life and of mental development. *It results*—so far as science can observe it—*from a mingling of self-determination* (mysterious, inexplicable, lying at the very base of psychical existence, and really serving as the point of origin for all our conceptions and convictions respecting "force," "influence," "causal efficiency," etc.) *and psychic reaction predetermined and necessitated by environment.* Here, in the term "environment" we must include for the present, all physiological preconditions and accompaniments of consciousness. And when we try, as it were, to absorb either one of these sides wholly in the other, we only succeed in contradicting the facts of consciousness, as such, in the interests of a theory which ends in unmeaning verbiage.

§ 16. The conception of character as including the whole (but only it) to which the activity and effect of willing may be thought of as extended, is very old, very natural, and very persistent. It has, therefore, an important psychological significance. The word, when thus used, fixes in a vague way—and only in a vague way can we use words here—the limits of conduct, of responsibility, of merit and blame, and even largely of æsthetical admiration or distaste. We do indeed extend these limits in our language as expressive of judgment and feeling, so as to comprehend a much wider realm under even vaguer words, such as "nature," "temperament," and the like. The deterministic theory, in its attempt to be strictly scientific, is actually compelled to resort to an explanation which is no explanation; it explains (!) by virtually asserting that souls, like atoms and other things, behave as they do behave, because "it is their *nature* to." But here, as so frequently elsewhere, the popular language is refreshingly naïve, to be sure, but truer to life and nearer to the heart of the case, than that of a pseudo-science. It would be quite impossible even to refer to all of the many ways in which such testimony is given. But to select a few examples; we find that, to a large extent, crude peoples, and, to some extent, all peoples, estimate by quite different standards the deeds ascribed to insanity, inspiration, demoniac possession, and even to genius, and those deeds which are imputed, as freely willed, to the Ego of the doer. The indwelling god, or dæmon, or *genius*, is admired or deprecated in the one case; the agent himself is held responsible in the other case. Yet even in the former case it is considered that one may consent or resist, to some extent at least (and yet again, Who can successfully resist Divinity?), such originally foreign influences. But the degree of successful consent or resistance depends upon, and in the future further determines, the character.

The obvious disposition at present to make public penalties independent of motive and of any debate concerning freedom of will, and all the increased subtleties of modern psychological and ethical philosophy, do not essentially alter this distinction. The distinction will continue to be made, because it belongs to the very depths of our conscious mental experience. In fact the increase of psychological knowledge chiefly serves to complicate the problems, rather than to solve them, much less to show that they may, with safety, be curtly dismissed. Not only experts, but even ignorant jurymen, are called upon to distinguish nice shades of imputability, and to apportion the rewards and punishments that character merits. The strange phenomena of hypnotism and the investigations into the causes of crime, into the constitution of the so-called criminal classes, and into morbid conditions of will, keep this distinction ever before us; while all investigation shows how much more complicated the entire subject is than had formerly been supposed. Meanwhile our daily practice is full of enlightenment. Thus we say of ourselves: "I cannot (easily, or at all) acquire that type of good character; my temperament is so unfortunate." Or, again: "There is no merit in my being good in this way, it is so natural for me." But on the other hand, we add to our æsthetical repulsion the genuine ethical feeling of horror, when we conceive of monstrous and "unnatural" conduct as being accepted, or as not being—at least tentatively—inhibited, by a deed of will. With such crude, but most significant exercise of judgment, more or

less prejudiced by emotional impulses, we send some to the prison or the gallows, and let others go scot-free; and vibrate our criminal classes between the hospital, or the insane asylum, and the jail. The constant, psychologically significant thing is, not that our judgment is so necessarily faulty, but that we venture—nay, that we feel positively impelled—to set ourselves up, as gods, over ourselves and over our fellow-men. But such procedure necessarily results from the development of experience in the lines of consciousness of freedom, conception of character as imputable, and ethical sentiment.

§ 17. We shall subsequently see that the principle of habit is regnant in every form of mental life. Yet in the case of will we do not say "regnant over," with the same meaning of the words. Settled character (ἦθος) is indeed, according to the Stoic conception, "always to *will* the same and *nil* the same." But it has also been truly said that the "character is a *habitus*, not which *has* the Ego, but which the Ego *is*." Thus regarded, the self-determination of the will, as character, may be spoken of as ruling over the individual volitions and bringing them, under law, into right relations toward the adopted ends. So do these individual volitions themselves become both expressive of, and tributary toward, the continuous development of character. But since these individual volitions all have reference to ends, either near or remote, and all are connected with the excitement of the affections, passions, desires, and sentiments, we can comprehend the possibility of the entire mental life being organized in accordance with certain chosen practical principles.

Once more: Among these practical principles there are—as we have seen (p. 579 f.)—certain ones which are presented and backed up with a peculiar feeling of obligation. Ethical judgments become commands—presenting themselves to the will as maxims requiring allegiance, bidding or forbidding how one *ought to choose* (or *shall*, yet *freely*, will). The wider import and completer justification of this unique experience of a command arising within that has reference to a felt obligation, and to a freely rendered consent, does not concern us at this time. We only notice that Schopenhauer's dictum—to say "ought to will" is no better than to say "wooden iron"—flies squarely in the face of the facts of consciousness, as such. And we may as well remark here in general that any philosophical theory which maintains a similar attitude toward the descriptive science of psychology is doomed to failure in its efforts to explain the world aright. Indeed, it is eminently true of all ethical maxims, that the maxims themselves, in order to be really *maxims* must present themselves in this very way—namely, as defining what ought to be willed. As *practical* they must be wrought into life, must become part of the history[1] of life.

It is obvious that, in our description and explanation of the development of faculty, we have now come to that which is both last and highest and also most fundamental. With the phenomena of developed Will we reach again the limits of scientific

[1] Comp. Volkmann: Lehrbuch d. Psychologie, II., p. 465 f.

study. The problems raised must be handed over to ethics and to philosophy.

[Most of the works to which we care to refer have already been mentioned at the close of Chapters V., XI., and XXV. In addition, however, the following may be consulted: Galton: Inquiries into Human Faculty. Paulhan: L'Activité Mentale, etc. Fouillée: La Liberté et le Déterminisme. Garnier: Traité des Facultés de l'Âme. Wiese: Die Bildung d. Willens. Guyau: Education and Heredity. Martin: L'Education du Caractère. Van Velzen: Ueber d. Geisterfreiheit. Hebler: Elemente einer philosoph. Freiheitslehre. Schellwien: Der Wille die Quelle d. Bewusstseins; and the many other writings on Ethics and special treatises on the Will, its Freedom, the Law of Causality, etc.]

CHAPTER XXVII.

TYPES AND PRINCIPLES OF MENTAL DEVELOPMENT

THE phenomena of mental life, whether considered as consisting of the most elementary psychical processes, or of the developed activities ascribed to various forms of so-called faculty, admit of an indefinite variability; and the courses in development followed by this life are correspondingly varied. It is this fact which imparts to every human being his psychological individuality; it is this which makes the life-history of every individual something distinctly peculiar to himself. And yet, as we have assumed from the start, mental phenomena admit of being classified, described in general terms, and, to some extent at least, formulated under general relations called laws; otherwise there could be no science of psychology.

We have now, however, briefly to consider a class of subjects which lie somewhat aside from our previous inquiries, in two different directions. Certain individuals, as well as certain states of consciousness, present themselves with marked characteristics amounting to idiosyncrasies. Such individuals are called oddities, monstrosities, geniuses, or what not in the line of extreme variability from the recognized types. As examples we may note the musical or mathematical prodigies, the young who show unaccountable tendencies to strange crimes, or the men and women of such unexampled natural gifts or peerless attainments and character, that they seem set apart from the rest of their kind. Moreover, states of consciousness occasionally arise that appear to differ so completely from those of our nearly universal experience as to throw doubt over the conclusions which psychology has, in the past, felt warranted in basing upon such experience. Here our attention may be called to the phenomena of "double consciousness," in their relation to our conception of the nature of the Ego, of the authority of self-consciousness, and of the identity and reality of the Self. Alike troublesome to a normal psychology are many of the strange phenomena of hypnosis, with all the alleged facts of telepathy, clairvoyance, and the like. In this direction of psychological investigation it

would be quite impossible for us to go with any thoroughness in the present treatise. To pass such subjects by we believe to be far more safe and scientific than to assume knowledge where knowledge is lacking; or even to amuse our readers with a chapter or two of doubtful yet fascinating conjectures. A word or two, however, at this point (see § 1) will not be out of place.

But in another direction of supplementary discussion we propose to go somewhat farther. This direction may be described as the semi-anthropological and historical. Between infinite individuality and the most general doctrine of faculties there lie certain considerations which help us to group together many individuals, while not altering our general psychological doctrine in order to suit our grouping. It is simple matter of fact that some individuals are, from the beginning of mental life, more like other individuals of a second group than any of either group are like still a third possible group. A is more like B than either B or C is like D; and yet both B and C are more like D than D is like X. Thus we may arrive at the justifiable though confessedly rather vague conception of "*types*" of human nature, to which larger or smaller numbers of individuals more or less conform. Nor does this conception altogether lose its value when the undoubted fact is pointed out that between all remote types lie interrelated types, less dissimilar; or even that, in each group, the individuals may be arranged so as to form a continuous line connecting this particular group with one on either side. Still further in somewhat similar direction lies the conception of general principles applying to all mental development, and to all the faculties considered as being interrelated modes of the behavior of the mind. It is to selected ones of these types and principles that we purpose to devote this concluding chapter of our psychological treatise.

§ 1. It is a hopeful indication of the increasing interest in psychological investigation that so many hundreds of treatises are being written upon all sorts of obscure, abnormal, and pathological psychoses. The candid and sober student of psychology will never regret this interest; much less will he fear or oppose it. At the same time, in our approach to such subjects of investigation we must preserve carefully, and even sacredly, the scientific spirit and the scientific method of investigation. And if, on the one hand, these teach us not to pronounce prematurely against the possibility of what is strange and unusual, what does not accord with accepted theory, it must never be forgotten, on the other hand, that science cannot relax its grasp upon even its seeming possessions, in order to clutch at vagaries or grope after ghosts. On the contrary, the true scientific procedure is from the known, or the apparently known, to the strange and startling. We can

never rightfully be asked to accept new theories, or even alleged new facts if they are particularly difficult to establish *as facts*, without being permitted to raise the previous question as to how they will fit in with the whole established structure of our recognized experience.

On this entire subject we will attempt nothing more than to indicate our conviction. This conviction is, however, born of investigation without conscious prejudice, and borne out, we believe, by the signs of the times and by the tendencies of modern psychological research. *The explanation of new mysteries* (in telepathy, clairvoyance, double consciousness, etc.) *is all to be sought and found by following clews which psychology already has in its hand.* In fact, there are no mysteries so profound and ultimately unassailable as those of ordinary experience. The direction in which to look for the understanding of novelties is that of an extension of those principles with which we are already familiar. While it is true that there is far more in man, as body and mind, than we yet know, or perhaps even imagine; it is also true that in all the most abnormal and pathological conditions, as well as in the case of all the extremes of idiosyncrasy, the nervous system, the laws and history of mental development, and the relations of mind and body, remain essentially the same. For example, there is no perceptible break, or important gap, in the line that may be drawn from that "dramatic sundering" of the Ego into two or more centers of representation, of itself to itself, in which young children find much of the zest of their early plays, and which we all experience so frequently (in dreams, by day or by night, or every time, urged on by conscience, we sit down to "have it out with ourselves") and the wildest vagaries of "double consciousness," or the most perplexing tricks played with one another by *Ego* and *alter Ego*. So, too, to take another example: physiological and experimental psychology are constantly throwing new light upon the incredible sensitiveness, in certain states, of the nervous mechanism, and upon the almost limitless application of the principles of "tact," "suggestion," and "habit," within the whole realm of the so-called unconscious or dimly conscious. Comparative psychology is constantly adding new wonders regarding the achievements of so-called instinct in the lower animals; helped on by the higher powers of the microscope, it is advancing in the attempt to fathom the "psychic life of micro-organisms." It is thus extending the conception of some psychic and teleological principle—call it "Soul," or what one will—downward and outward. And the reign of mere physical explanation seems about to be followed by one in which *Psyche* shall again somehow be acknowledged as supreme. If this is vague and figurative language—as indeed it is—it is not so hopelessly vague and purely figurative as that which explains apparently mental phenomena in terms of physical tendencies, strains, and entities. And the lesson for both physical and psychological science is essentially the same. No wholly new view of the nature of mind, and of its relations to body, or of the meaning and value of the facts of consciousness, can possibly arise out of hypnotism. No wholly new ethics can be adopted as the result of the attempts at a so-called science of criminology. Hypnotism will be explained by new combinations and further extensions of the factors and laws of normal mental life; and the criminal will be found to be not so much a "type" as simply a man essentially like unto his fellows.

The various groupings of individuals (or "types" of being and development) which we shall now briefly consider follow these four combinations of marks: Temperament, Sex, Age, and Race. Regarding certain aggregates of characteristic qualities we may therefore speak of the "sanguine" or "choleric," of the "masculine" or "feminine," of the "infantile" or "senile," of the Oriental or Anglo-Saxon type of mind. It must be confessed, however, that the data on which these classifications are based are, to a large extent, uncertain and, to some extent, extra-psychological. Hence the considerable admixture of vague popular impression which characterizes most treatments of the doctrine of temperament, sex, and race; and, if we try to escape from this vagueness and become more definite, we are caught by the tendency to substitute uncertain inferences from physical measurements and from statistics for legitimate conclusions based on known facts of consciousness. However, this line of studies has a certain value for scientific psychology.

The doctrine of Temperament is very old, persistent, and widely spread. *By a temperament we understand any marked type of mental constitution and development due to inherited characteristics of the bodily organism.* These two principal points are therefore emphasized by all correct use of the word. The aggregate of characteristic psychical qualities thus indicated is regarded (1) as peculiarly dependent upon the bodily basis, and (2) as a matter of original constitution or heredity. Nevertheless, on both these points our information is far from being satisfactory; and the various theories of temperament have consequently differed greatly in the accounts they have given of its physical and inherited origin. It may be said, however, that, in spite of all disagreement in details, both the foregoing points may be accepted. With respect to the first, modern research has justly led us to regard the constitution of the nervous system as containing, in a general way, our account of the characteristic differences of temperament. But inasmuch as this system cannot be separated from the other systems of bodily organs, although it is the central city and the crowned ruler for them all, the constitution of the vaso-motor, of the digestive, and of the muscular organs, has indirectly to do with the determining of every man's temperament. Within the nervous mechanism itself it is the constitution of the end-organs of sense and of the central organs which is of prime influence. These may be said to differ "naturally" in respect of their absolute and relative sensitiveness to normal stimuli, the rapidity and duration of re-

sponse which they give to the various degrees of such stimuli, and the relative facility with which certain combinations, rather than others, are made within the central nervous system. But the blood is the internal stimulus both of the end-organs (in the case of the *eigenlicht* of the retina, certain temperature and other skin sensations, etc.) and of the central organs; and the constitution of the sanguineous currents determines the character of this stimulation. This constitution is itself, in turn, determined largely by the character of the digestive processes and their products. Moreover, by these processes and products the nervous system is directly and profoundly affected throughout the entire areas of the thoracic and abdominal cavities. Looking further outward, we observe the significant connection of the muscles with the nervous system. This connection works both ways; the muscles excite to activity the cerebral centers; and these centers themselves are largely impotent, with respect even to the knowledge of self and of things, except as they excite and control the muscles. In this complicated fashion, then, both directly and indirectly, is the bodily and constitutional basis of temperament to be considered.

Our second consideration (temperament is original and hereditary) introduces yet new and more profound complications. It requires us to distinguish temperament from character in the more precise meaning of the latter word. Men's characters change; or, rather, men change their characters. But men's temperaments do not materially change; at least, they do not pass from one type to another, as the man of bad character becomes good, or *vice versa*. So we are accustomed to think and say. At the same time it is necessary here to recall what has already been said as to the impossibility of our distinguishing between the two great classes of factors which coöperate in all mental development. Temperament may, indeed, safely be said to be prominent at the beginning and from the beginning; whereas character comes to view later and in a much more unpredictable way, if indeed we regard it as a possible principle for scientific classification at all. On the other hand, character often so "overlays" temperament as to seem to alter it totally. Temperament itself is so subject to the influence of environment as to seem to change from one type to another under its influence. In spite of these admissions the persuasion remains tolerably firm: there are certain original and inherited types, or aggregates of characteristic qualities, which tend strongly to remain, and generally do remain, essentially unchanged throughout the mental life of the individual. So that even where what we call char-

acter overlays temperament, it only *overlays* it; that is to say, the characteristic typical tendencies to certain ways of reacting on stimuli, and of combining the effects of previous reactions, remain unchanged. *Self-determination as respects character is limited by that determination of self which reposes upon an inherited physical constitution.*

As to the Kinds of Temperament which must be recognized there has been much dispute; there has been also some variation in the employment of terms to designate the chosen kinds. Singularly enough, however, the number four has largely prevailed; and this indicates that certain grounds for its preference really exist. Adopting it, we mention the following different temperamental types: (1) The sanguine; (2) the sentimental (so Lotze usually called the "melancholic"); (3) the choleric; and (4) the phlegmatic. Individuals markedly distinguishable according to either one of these four types can, without much difficulty, be selected from among any large number, whatever be their sex, age, or race. Such individuals are also to be found in all grades of society and with all degrees and kinds of culture. It is not, however, an altogether fanciful conjecture which connects in general certain of these temperaments with one of the two sexes, with the four principal ages of life, and with certain races as compared with other races. But, in general, races that are low in the scale of development show all the characteristic four temperaments in a less marked way; while the conditions of a higher civilization allow of the expression, and perhaps also of the rise, of temperament in a more intense form. And, finally, most individuals, even in the most highly civilized communities, show more or less mixture of the different types. Even those who are called "moody" may have as the peculiarity of their constitution that they pass from one type to another in a largely incalculable way; although just *this* is one chief characteristic of the sentimental temperament.

§ 2. The various words in use to characterize the different temperaments are highly instructive. They show the persistent and wide-spread impression that the lines are laid down, within which the development of the individual takes place, by some form of physical influence that operates upon the original "make-up" of the individual. When men believed in astrology they found in the determining power of the planets a reason why some were "Jovial," others "Saturnine," and still others "Mercurial," in temperament. When they more justly recognized the influence of the circulatory and digestive systems over everyone's "temper" of mind, they came to speak of the "sanguine" (or "full-blooded") man, of the "choleric" (or "full of bile") man, of the melancholic (or "full of black bile") man, and of the

phlegmatic (or "full-phlegmed") man. Thus, in Shakespeare's "King John" we read:

> "Or if that surly spirit, melancholy,
> Had baked thy blood and made it heavy, thick, which
> Else, runs tickling up and down the veins."

As to telluric influences, however indirect, upon the constitution and functions of the nervous mechanism, we have to-day little more positive information than had the men of previous generations. Increase of knowledge here is mostly in the line of surrendering the pretence of knowledge; and no doctrine as to the exact nature of the physical basis of temperament can even now be laid down. But, as has been said, the general view is credibly established, that the constitution of the nervous system of different individuals differs as respects its susceptibility to the different forms of external and internal stimuli, and as to its tendencies to combine these primary forms of reaction in various ways.

If now we think out in detail the possibilities involved in the foregoing differences, we shall see how temperaments may come to exist. For the different possible reactions of the nervous mechanism may differ (1) as respects the kind of reaction; (2) as respects the measure of sensitiveness shown; (3) as respects duration at the time, and conservative power as laying the basis of cerebral habit; (4) as respects the rapidity of reproduction; (5) as respects completeness of reproduction; (6) as respects the rapidity of combination; (7) as respects the kinds of combination most favored; but especially (8) as respects the characteristic accompaniments of feeling. And here we may refer again to what was said respecting the very nature of feeling and of its cerebral basis (see p. 173 f.).

§ 3. Although no agreement exists as to the principles of division, or as to the fundamental nature of the physical basis of temperaments, almost all writers acknowledge essentially the same four. A modern writer,[1] approaching the subject from the scientific point of view, by crossing two principles of division, derives the following scheme:

	Strong.	*Weak.*
Quick	Choleric.	Sanguine.
Slow	Melancholic.	Phlegmatic.

Thus choleric and melancholic persons are inclined to strong affections, and sanguine and phlegmatic persons to weak affections; but the choleric and sanguine are quick, while the melancholic and phlegmatic are slow. It does not seem, however, that the phlegmatic, though slow, are necessarily weak. By substituting the term "sentimental" for melancholic, Lotze breaks up this system, but makes it more difficult to distinguish between the sentimental and the sanguine.

In a somewhat indefinite way we may declare that a certain type of persons is characterized by lively and varied excitability and rapid change, without depth and stability; and these may be called *sanguine*. Another type is scarcely less quick, though less varied in reactions; while the reac-

[1] Wundt: Physiologische Psychologie (second ed.), II., p. 345 f.

tions are more enduring, passionate, and determined, and the conduct as well as states of consciousness less subject to change. This type we may call *choleric*. Still others are characteristically sluggish in all their psychical changes and in respect of the movements which both condition and express such changes. They are the opposite of lively and versatile, though they may be either tenacious or lacking in what we call will. To such the name of *phlegmatic* is assigned. This leaves a fourth not easily describable type. It may be called the poetic or artistic temperament. But then poets and artists share, with all men, in all kinds of temperament. Nevertheless, there may be said to be a distinctively *poetic*, or—to use Lotze's word—a "sentimental" temperament. This type is described as characterized by "special receptivity for the feeling of the value of all possible relations," although indifferent toward bare matter of fact.[1] Persons of this type are lively in imagination, susceptible to delicate sense-impressions, moody in feeling, uncertain in conduct.

§ 4. Even so modern a writer as Wundt agrees with the proposal to apply the conception of temperament to orders, families, and species of animals, as well as to man. The classification of types is thus mixed up with considerations of age and sex and race. For youth may undoubtedly be said to be more "naturally" sanguine or sentimental; maturity more choleric; and old age more phlegmatic. The sentimental temperament is also characteristically more feminine than masculine; the choleric is more masculine than feminine. As to the precise temperamental distinctions which are emphasized by the different principal races, there is abundant room for debate; just as there is no agreement yet reached by anthropologists concerning the division of mankind among these races, and scarcely more agreement in the estimate which natives have put upon them by foreigners, or put upon themselves when comparing themselves with foreigners. Marked instances of aggregates of characteristic qualities, which seem to be the same for a recognized type of temperament and for a certain race—considered as respects the average individual of the race—may perhaps be given with confidence, when we call the French sanguine, the Germans phlegmatic, the English a mixture of phlegmatic and choleric, the Japanese sentimental. This would seem to accord fairly well with the remark that the choleric and phlegmatic are temperaments of action; while the sanguine and sentimental are temperaments of feeling. But both sexes and all races show examples of every form of distinct temperament, as well as of every shade of mixture possible among all four.

The psychological Peculiarities which distinguish the two Sexes are scarcely less a matter of debate than are those which serve to difference the four temperaments. Yet the student of literature and history, as well as the acute observer of life from the points of view belonging to physiology and psychology, can scarcely doubt the general justness of that popular opinion which considers the markedly feminine as differing from the

[1] Lotze's doctrine of temperament may be found, Microcosmus, II., p. 94 f.; Medicin. Psychologie, p. 560 f.; Outlines of Psychology, p. 187.

markedly masculine type. How does the average adult woman differ from the average adult man? is a question to which an almost endless variety of answers might be given. But that there is a difference, is almost universally assumed; and this—we believe—upon sufficient, though vague, evidence. Of course, the question is still further complicated when the attempt is made to tell how much of this difference is matter of relatively unchangeable sexual constitution, and how much is due to variable physical, social, and educational differences, peculiar to each sex. The prevalent—but we believe, foolish and vain—proposal to train away all these differences, or to change them by changing the environment, is always ready with its appeal to the force of heredity and the force of education, whenever it suits its purpose to lay the principal stress upon either so-called "force."

As to fundamental physical differences of sex there is much, of course, which is obvious enough, and which can in some sort be estimated and measured. Of such physical characteristics some are more nearly constant, others are periodic, and still others are epochal. But modern histological and physiological research is constantly bringing to light the minuter, and yet even more pervasive and potential, differences. It would seem as though the investigation, when approached from this point of view, must result in the persuasion that, not only in respect of gross mass and characteristic organs as a totality do males and females differ; but that the sexual difference extends to every detail of the nervous system, to the constitution of the blood, to the habits of metabolism, etc. But even then, it is so mingled with other differences in types of temperament, kinds of character, habits formed under the influence of environment and by education, as to show itself persistently, and on the average, and to the ordinary observer, only in its broadest outlines.

It is to be hoped, and perhaps it is very reasonably to be expected, that more detailed observations of the phenomena of child-life, of the changes (both physical and psychical) which occur at the great climacterics, and more critical study of literature, with the problems of psychology in view, will give us, finally, a scientific psychology of sex. Meanwhile, we are obliged to content ourselves with such rather indefinite generalizations as everyone supposes himself able to make equally well with the most thoroughly trained psychologists. Moreover, just at present (in this country especially) the *status* of woman is so uncertain and the discussion of the so-called "woman question" committed to such hands, that it is difficult to get even the barest physiological data regarded without prejudice; and yet

more difficult to secure fairness and candor for their thorough scientific discussion. We shall do little more in this place than to record our conviction that the sexual differences, on the psychological side, are as minute, pervasive, and influential as on the anatomical and physiological side. While it is true that men and women are, in respect of all psychical faculties and kinds of psychoses both equally human; it is also true that the characteristically feminine is throughout different from the characteristically masculine, and that *these* differences shade the entire mental life and development of the two sexes from the moment of birth (and even long before birth) to the moment of dissolution.

§ 5. Besides the more obvious organic and functional differences of the adult man and woman, the two sexes show an average difference from birth in height, weight (especially as connected with muscular development), physical energy, relative proportion and growth of organs, and frequency of pulse and respiration. Among the different races, and under the different conditions of nutrition, care, etc., the average length and weight of infants differs greatly. But everywhere the average length and weight of the female is somewhat less than that of the male. At maturity these differences are yet more marked. In Brussels, for example, the average length of the male infant compared with the female at birth, was as 19¼ to 19½; the weight as 7.05 lbs. to 6.42 lbs. The curve of the growth of the two differs, though scarcely perceptibly, up to four or five years; while at puberty the difference becomes much more marked. The relative proportion of the bodily members, and even of the different parts of the same bodily members, differs for the two sexes. The relative length of the arms and legs in the male is greater; the center of gravity is higher, the step is longer. He is obviously built to his advantage in swift, strong, agile movements. He breathes more deeply (and this, as a matter of physiological need); he requires and consumes more air, water, and food. The average pulse of the female is quicker in about the same proportion as that in which her height is less. Her blood is less in quantity, of lighter specific gravity, and contains fewer red corpuscles. Physiologically, she is more inclined to be hyperæsthetic, to become subject to cramping and spasmodic action of the muscles, to sudden and incalculable secretions, to wide-spreading and chaotic neural excitements.

It is in respect, however, of the nervous and muscular systems that the differences which are most important as laying the basis for psychological types emerge. The average weight of the brain of the two sexes differs about as 1,424 for the male to 1,272 for the female. There seems reason to believe that the cerebral differences extend much more widely than is sufficient to cover gross mass. The claim seems justifiable that differences in the development of the cerebral convolutions may be distinguished from the eighth month, or even earlier, onward.[1] The male develops not only

[1] See J. Mingazzini, Moleschott's Untersch. XIII. vi., p. 498 f., reviewed in Centralblatt f. Physiol., No. 5, 1888.

an absolutely greater cerebral surface, but also a relatively greater growth of the parts lying in front of the central fissure as compared with those lying behind it.

Into the profound and all-pervasive effect of those physiological functions of sex which connect directly and indirectly with the cerebro-spinal nervous system, in its relation to the sympathetic system, it is not necessary to enter. We have already abundantly showed how the sensations and feelings which originate in this way alter the whole stream of consciousness. They extend their influence even to the conceptions we have of Self and to the knowledge we have of Things. It might seem fanciful to assert that *things* are known as *felt* to woman, rather than as *thought* by man; but such a statement would by no means be wholly devoid of support from the facts.

§ 6. All our study hitherto has led us to emphasize greatly the influence upon mental development of the constitution and functions of the muscular system. This influence is extended variously, but chiefly in two directions. The condition and action of all the muscles stand in reciprocal relations to the senses, and to the feelings which form the necessary affective accompaniment of the senses. Furthermore, the striated (or so-called "voluntary") muscles are the organs of the will. In this complicated sensory-motor apparatus all the most primary foundations of the intellectual life are laid. Figuratively speaking, discriminating consciousness, as the essential function of intellect, moves about among this original chaos of sensory-motor factors, and with a constant focusing and redistribution of attention, progressively organizes it into intelligible forms. Moreover, as the very precondition and also as the effect of development, the conscious control of the sensory-motor organism in the behalf of recognized ends progressively takes place. Here again, the reactionary effect of voluntary control of the muscles upon the characteristic sensations and feelings is undoubtedly very great. All this is only one particular necessary result of the constant interdependence of knowledge, feeling, and will, in the entire development of soul-life. Since judgment and decision are necessarily involved in the mental activities belonging to sensation and motion, how can it be otherwise than that the feminine and masculine types of intellect differ? This difference probably reaches all the way up from the superior "feeling-deftness" of feminine manifestation, as compared with the superior tactual discrimination and muscular precision of man, to those abstract conceptions of space in which Lotze supposes a distinctly feminine type may be discovered (see p. 490).

§ 7. There is probably good ground for the popular impression that men and women differ most, upon the average, in respect of their feelings, and in respect of their ways of looking at things, events, and conduct, as influenced by the feelings. This distinction of types also—it is probable—reaches through the entire area of mental life and its development. Such a distinction seems to be much more radical and far-reaching than are those distinctions upon which the temperaments are based. Therefore none of the temperaments, when superimposed, destroys the more fundamental type characterizing the sex. The sanguine woman differs from the sanguine man—this is as true as that the choleric woman is more masculine than the average woman, and the sentimental man more feminine than the aver-

age man. In this sexual distinction all kinds of feelings appear to share—notably the intra-organic and sensuous, but also the intellectual, æsthetical, and religious.

Space is lacking—even were this treatise the fit occasion—for discussing how men and women differ as regards the so-called "higher faculties." We cannot forbear remarking, however, that any such discussion involves some sort of agreement as to what faculties are *higher*, and what particular forms of the functioning of any faculty are entitled to this same term. If the exercise of the faculties in the pursuit of knowledge of fact and law is highest, then we have to inquire why women have hitherto done so little relatively for science and philosophy. But if the intuitions and sentiments which enter into artistic achievement are highest; then we have to inquire why they have not accomplished more in art—especially, for example, in music, where their opportunity has been so great for generations. If ethical feeling and conduct are highest; then we have to inquire where justice and magnanimity stand in the scale of virtues—and so on, somewhat indefinitely. Manifestly, these questions extend beyond the legitimate sphere of descriptive psychology, although they cannot be answered without a constant appeal to psychology.

Those psychological types that are characteristic of Age and Race can receive only the briefest mention by us. As to the entire group of inquiries involved in the psychology of the different races, we have only scant trustworthy information. The objective determinations which anthropology proposes—with its measurement of skulls, its study of habits of building, of implements, etc., its division of ages—have any value only as it is possible to give them an accepted psychological interpretation. Without the scientific knowledge of the facts of consciousness, as such, these data, which are at best *only* tokens, cannot do service even as *tokens* of anything of a psychological sort. To interpret the anthropological data a scientific knowledge of human consciousness, as a unique life-development, is presupposed. Without this knowledge such data may mislead to almost any conceivable extent; with this knowledge they may be interpreted so as to show what almost infinite variety subsists under the one human type of mental life; and they may also, of course, expand our notions of this one type as well as of the relations sustained to it by the principal subordinate types.

As respects the influence of Age upon the aggregate of psychological characteristics, the most of what we should wish to say has already been said. For we have traced the general course of the development of mental life, the formation of faculty, the growth of knowledge, the progressive self-determination of character, the increasing teleology of mental activity. This course of development is continuous. Nevertheless,

the beginnings of it in infancy and childhood have a peculiar interest and value; but they are also peculiarly difficult to trace. Out of the unconscious, somehow, does the conscious seem to come; the organization of mentality out of the confused and chaotic material of sensation and representation. Science can never put its finger on any definite moment and say, respecting the truly psychological: "Now it is, for the first time, there!" Psychological investigation—no matter how, or how faithfully, conducted—cannot describe the mode in which elementary faculties come to be, without implying that they have already begun to do their work. But then this is not a disadvantage (if it be, indeed, a disadvantage at all) peculiar to psychology. Every physical science has to assume much more than this; it has certainly to assume formed conscious faculty as already at work; its universal formula is: *In the beginning was Mind, already equipped to see and hear and remember and imagine and think.*

In spite of the principle of continuity, however, the influence of age may be broadly distinguished as productive of psychological types. We have already seen how certain temperaments are distinctive of, or correspond to, the several main divisions of age. We have also seen how consciousness is profoundly affected, especially on the side of feeling, at certain epochs in the physical life. And the study of the correlative development of the physical basis and of the changing character of the psychoses is a most helpful adjunct to the psychologist.

§ 8. We must not be understood as depreciating the study of racial psychology, or the influence of anthropology upon psychology. On the contrary, the spirit of the narrowness of the old-fashioned introspective psychology is exorcised by the wider observation of the typical forms of mental development which the races show; and to the trained psychologist much truth concerning the nature of mind may be gained by the skilful interpretation of anthropological data. At the same time it remains forever true that *mind can be interpreted only in terms of consciousness; and that the true interpretation of all anthropological data can be gained only by progressive psychological science.* Anthropology, so-called, will always remain dependent upon psychology for assured knowledge as to the mental life of man.

§ 9. The psychology of infancy and childhood is becoming an increasingly important and promising branch of the science. The attempts to carry our knowledge back into the life of the embryo are not without a certain value; although here, inasmuch as psychology must found itself upon facts of consciousness, as such, we can scarcely attain scientific certainty. It is a reasonable conjecture that sensations of pressure, and motion, and, perhaps also, of temperature, arise before birth. Some authors[1] would have us suppose that the fœtus may have ocular sensations due to pressure on

[1] See Beaunis: Les Sensations internes, p. 218 f. and 280 f. Preyer: Mind of the Child, I. p. 95 f.

the eyeball and resembling phosphenes, and even gustatory sensations occasioned by swallowing certain surrounding fluids. It is said that with infants born prematurely, their movements seem to indicate that they taste the sugar or quinine put into their mouths; and that certain odors are appreciated as disagreeable sensations.

All newly born infants are deaf, since the middle-ear is filled at birth with a gelatinous mass of embryonic connective tissue. Some observers think that the eyes of the infant—during its first days seldom open for any length of time—move with associated and coördinated movements; others think not. No conscious acts of will are apparent in such movement until much later. Most important are the facts that the reflex irritability of the infant's skin is so inferior to that of the adult, and only approaches it after experiencing the effects of constant cultivation; and also that the entire muscular apparatus is relatively undeveloped. The significant thing is, that nature seems to have prepared the newly born infant with a relatively large development of brain and of the more special organs of sense—made ready for the beginnings of sensory-motor experience—but not with experience already gained in correspondence to its merely physical evolution.

It has for a long time been charged against psychology that it is unable to exhibit any system of General Laws or Principles comparable to those which constitute the body of the more advanced physical sciences. Or, more definitely still, it is alleged that the study expended upon the phenomena of human consciousness, from Aristotle to the present time, has not succeeded in formulating a single precise statement, like that which physics can give for the gravitation of masses or chemistry for the "equivalences" of the atoms. In some sort, the student of psychology is obliged to confess that the charge is true. Nor does it seem to be much less true in view of the attempts of Herbart[1] and others to give a mathematical foundation to psychological principles. To be sure, the modern form of psycho-physics is making a brave and partially successful effort to measure different forms of mental processes, and to state in precise formulas the results of its measurements. But we still find psychologists themselves confessing, explaining, and complaining, in view of the absence of universally recognized and definitely statable *laws* in the science of psychology.

And here, at the close of our treatise, we may return to the inquiry with which it began. What wonder then that we are asked whether it is right to consider or denominate psychology as *science* at all? And if it be not by this time a "science," what claim can we substantiate why we should pursue it longer in the hope of attaining scientific knowledge? Psychology

[1] The work of this author bore the title, Psychologie als Wissenschaft, neu gegründet auf Erfahrung, Metaphysik, und *Mathematik*. (1824).

might indeed, turn the question with most invincible force against many of those who ask it; it might, in turn, ask what sort of physical science can be built up securely on perception, inference, and imagination, helped out and expressed by words and figures, if we can have no knowledge respecting the nature and valid use of perceiving, inferring, and image-making faculty itself, and respecting the relations in which the symbols of all science stand to the only immediately given data, the "states of consciousness, as such?" The better way, however, is that milder form of answer which we have already given. There is science wherever there are ascertainable facts that may be described and explained in their relations to one another and to other classes of facts. And who will venture to affirm that the facts of consciousness, considered as such, do actually relate themselves to one another, or to facts of "brain-states," or to what-not other kinds of facts, in invariable forms of sequence, as the facts of physics and chemistry stand related to each other?

There appear, however, to be certain generalizations possible of a higher order than any which we have yet attempted. There *are*, it would seem, certain principles which belong to all development of the mental life of man; and every state of consciousness, and every form of so-called faculty in every stage of its formation, appears to conform to these principles. They cannot, indeed, be thrown into the terms of mathematical formulas. To attempt this would be not to increase real science, but only to put forward the pretence of science. We must, therefore, be content to state these principles in the somewhat vague general way which becomes their nature; and we distinguish the following four: The principle of Continuity; the principle of Relativity; the principle of Solidarity; and the principle of Teleological Import.

§ 10. In what sense we consider psychology a science has already been, not only defined, but also illustrated by the entire course of our investigation; in what sense also the term "natural science" may be applied to the results of psychological investigation. The ascertainable conditions of the phenomena of consciousness are such as to place them, through the nervous system with its end-organs of sense, and its central organs as dependent upon blood-supply, in connection with "nature" at large. In the other direction, as it were, by the expression which these same phenomena get through resulting changes of the motor system, they are further placed in connection with this same nature at large. At the same time, the assumption that the only real correlates, or causes, or knowable conditions of the phenomena of consciousness are brain-states, and that psychology is not a science until it has ascertained a system of "blank unmediated correspondences" between conscious phenomena and conjectural brain-states, we consider quite unwar-

rantable. Nor do we sympathize in the least with a confession of weakness —for example—because "psychology is still in the condition of chemistry before Lavoisier;"[1] nor look forward with the expectation that soon some Lavoisier will arise to rescue it from its present depressed condition. On the contrary, all such comparisons between the two classes of sciences as respects their aims and their possibilities, seem to us inept and misleading.

By the Principle of Continuity we understand that, *when the mental life is regarded as a whole, no breaks or sudden leaps are found, whether as between its factors and faculties, or as between the different successive states and stages of its development.* Stated more positively:—the very distinctions, by making which the factors are differenced and the so-called faculties defined, in the real life of the mind shade into each other; and the evidences of growth and progress which mark the different parts of the life of consciousness, in each period of growth and each degree of progress, are such as connect the whole into one process of becoming. In a word, the very nature of the mind, so far as science can observe it, is seen in this unbroken vital flow. Its being is in being just such an uninterrupted stream of psychic life.

The principle of continuity, thus vaguely expressed, applies to all the fundamental factors as well as to the formed faculties of mental life. These factors may indeed be distinguished; and the science of psychology partly consists in making the necessary distinctions. By the very word "faculties" we mean to recognize the different modes of the behavior of mind, or the distinctly unlike forms of mental activity and mental life. At the same time it is true that the most clearly distinguishable of factors admit of being continuously connected by nearly, or quite, indistinguishable links; and the most unlike of so-called faculties involve, in the combination (so to speak) which they represent, the same fundamental processes. Thus we may proceed from one faculty to another, softening down or obliterating differences by interpolating modifications of both, which tend to bring the apparently most violent oppositions into closer proximity. Moreover, every stage of mental evolution requires that it should be connected by some clear recognitions, or other distinguishable traces, in consciousness itself, with the preceding stages, in order that the entire evolution may deserve the title of a *mental* evolution at all.

It is—in part, but in part only—this principle of continuity which gives its unique character to what we can observe of men-

[1] Comp. Professor James and President Schurman in the Philosophical Review, March and May, 1893.

tal development. In all forms of organic physical evolution (plants, and animals, and even, of course, the body and brain of man) the factors and stages of the evolution have some existence and value considered *in themselves*, as it were. But the case of mental development is not so. Its very nature as mental, we repeat, consists largely in this continuity which allows no factor, or faculty, or stage, to be considered as having any being in itself. Each factor, faculty, and stage exists for consciousness as in and of its own continuously flowing life-movement.

§ 11. To illustrate the principle of continuity as respects the factors, or more primary processes, of mental life, it is scarcely necessary to do more than refer to the entire treatment in Parts I. and II. We found, indeed, that the different sensations cannot be considered as evolutions of one primitive form, as the psychical correlate of the simple nervous shock. But we found also that this infinite variety of given sensations is capable of being, in the case of several of the senses, arranged in so-called "scales," where shades of quality and degrees of intensity merge in each other, so that the distinctions are not absolute. Thus of colors and musical sounds and sensations of pressure, we may form such a continuous series. Moreover, we found that, in actual experience, some of the more primary forms of sensation appear from the first as inextricably—so far as consciousness is concerned—woven together; so that, for example, the lines between tastes and smells, between tactual sensations and muscular sensations, and even between tactual and muscular sensations, on the one hand, and sensations of color and light, on the other hand, seem obliterated. Thus what are popularly known as *the* senses are found to be complexes of different theoretically, but not actually, distinguishable sensation-elements. Advancing further, the relation of the representative image to its sensation-original was investigated. And here it was found that between any *s* (the indubitably *sensation*-original) and its *i* (the recognizably *image*-representative), all degrees of "lifelikeness" may be interpolated. In other words, sensations and their representative images may be considered as arranged in a continuous scale. With even less difficulty is the continuity recognized which maintains itself between the image and the concept.

Turning to the aspect of feeling we meet at once with the apparently irreconcilable opposition between pleasure and pain. Yet even here a scale of degrees, with possible neutral feelings lying between the faintest members of the two opposed parties, and especially the undoubted presence in consciousness of mixed feelings, of some of which we can scarcely say whether they are more like pleasures or pains, help to soften the opposition. Moreover, one reason for the difficulty experienced in trying to distinguish the more primary kinds of feeling was found in the fact, that many of them shade into one another by such imperceptible degrees. Of conation, we seemed to discover that its continuity is temporal, and in the line of the perpetuation of habit, rather than in the possibility of having its different exhibitions arranged in scales of carefully shaded quality.

§ 12. But does not the existence, from the beginning to the end of mental development, of the three forms, or aspects, of psychic facts—intellective, affective, conative—limit, in an important way, this principle of continuity? Yes, undoubtedly; but only in some respects. These three forms of psychical existence are indeed irreducible; feelings cannot be derived from sensations or mental images, and conations are specifically unlike feelings or acts of knowledge, as such. The rather have we seen that every psychosis may be regarded in each of these three aspects; and that all actual experience is a complex in which knowledge, feeling, and will, are involved. Yet the facts that each state of consciousness is a living unity, as it were, capable of being regarded upon these different sides, and that all the acts of developed mind do thus reveal themselves as really intellective, affective, and conative, are illustrations of this very principle of continuity as lying at the base of mental development. Moreover, in that manifold complication of factors which psychological analysis discloses, we come upon states of consciousness about the classification of which we may well be in doubt. Of such states some seem to lie midway between intellection and feeling, others midway between feeling and will. For example, vague intra-organic sensations are not improperly called "bodily feelings;" and desires and wishes often seem almost indistinguishable from deeds of will. The ambiguous use of the word "feeling" emphasizes the former class of facts; the twofold division of human faculties, which actually includes wishes and volitions under the same general category, emphasizes the latter class of facts.

It only remains to notice that the entire theory of the nature and development of mental faculty, illustrates and enforces this same principle of continuity. What we have experience of with ourselves, what we know ourselves psychically to be, and to be doing, is not described fitly in terms of some single function, or individual activity among the classical number of so-called mental faculties. What we find ourselves to be doing is a marvellous and indescribable fulness of active life; a *continuum*, for the total expression of which the meagre separateness of processes and faculties seems a totally insufficient account.

Closely connected with the foregoing principle—and, indeed, in such a way that the two are interdependent—is the Principle of Relativity. The statement of this principle with which we must be content is perhaps vaguer than that which has been given to the principle of continuity. The word "relativity" has been used by various writers, both in psychology and in other forms of science or in philosophy, to cover a great variety of conceptions. And doubtless the so-called "law of relativity," in almost all of its many forms of statement, has been too frequently pushed to such an extreme as to involve an error, or even an absurdity. Yet we have no other term which so well expresses a principle that seems to apply to an almost indefinitely great number of psychological facts and subordinate laws. By the principle of relativity, as we understand it—negatively

stated—it is denied that any psychic factor, or complex psychosis, can exist without having its own definite quality, quantity, tone of feeling, value in combination, and influence upon simultaneous or successive factors and psychoses, determined by the *relation* in which it stands to other factors and psychoses in the entire mental life. Or—stated positively—*every individual element, or state, or form of mental life is what it is only as relative to other elements, states, and forms of the same mental life.*

The foregoing statement is, as has already been said, confessedly vague; yet it seems to group and hold together a vast number of very impressive facts that are fundamental in all mental development. It is not here given as a deduction from a metaphysical proposition like that of Lotze: "To be = to be related." It is rather made as an induction from the descriptive history of mental life. It does not mean simply that consciousness is subject to change; or even that a "field of consciousness unaltered by change" would be a blank—that is, no consciousness at all (Hobbes). Much less does it mean that every conscious presentation "is essentially nothing but" a transition or difference (compare Bain). Nor is it limited to the formula that "our sensations afford no absolute but only a *relative* measure of external impressions" (Wundt).[1] The first of these three statements is much broader, and the latter two are much more special and narrow, than the principle as we understand it. In a more concrete form the principle may be explained thus: Do I inquire as to any mental state, or as to any factor in any mental state (fixing my attention upon the content of consciousness, so far as possible, in its entirety, or isolating by analytic attention some aspect or factor of the whole): What is it—as respects quality, quantity, tone of feeling, etc.? Then the answer must be, this individual state, or factor, is what it is in dependence on its relations to other mental life of the same subject of all states.

Putting the two foregoing principles together, we may say, *the true picture of mental life is that of a continuum of interdependent psychoses;* or—if we may be so far metaphysical—*descriptive psychology ends in adopting the conception of a being with a unique unity of nature and an equally unique history of development.*

§ 13. The psychological doctrines usually included under the term "Law of Relativity" are summarized and criticised by Dr. Ward[2] under three heads: (1) Hobbes's celebrated dictum, that "to have the same thought or feeling always and not to think or feel at all are identical"

[1] In the first edition of his Physiologische Psychologie, p. 481.
[2] Article Psychology, Encyc. Brit., p. 49 f.

(*Idem semper sentire et non sentire ad idem recidunt*), is said, when made to apply to the whole field of consciousness, to "become at once true and trite." But surely the truth, that change is a necessary condition of all consciousness, however "trite," can scarcely be too constantly kept in view by the psychologist. Nor do we consider that the "constant impressions," sometimes called "fixed ideas," which occasionally seize upon and dominate the entire consciousness, "coloring or bewildering everything," afford any real exceptions to the principle. The questions for investigation concern the time-rate, character, and laws of this change; and on all these questions we have already sufficiently shown the evidence and expressed an opinion.

(2) If we are to understand Bain, when he declares, "All feeling is two-sided. . . . The state we have passed *to* is our explicit consciousness; the state we have passed *from* is our implicit consciousness, etc.," as holding that "all presentations *are but* differences," then we must dissent from the view, as does Dr. Ward. Surely, however, the latter misstates his own cause when he declares: "But in passing from the scent of a rose to the sound of a gong or a sting from a bee, we have no such means of bringing the two into relation." Now, in case of so abrupt a transition in the content and feeling-tone of two successive mental states, the law of relativity would—as we understand it—not be violated, but the more amply illustrated. The amount of our absorption in the scent of the rose would influence the redistribution of attention to the sound of the gong, and even to the sting of the bee; the degree of pain which the succeeding sensations of sound or smarting gave would be enhanced by the preceding pleasure; the control of the motor results of the new sensation would be determined by the perceptions, etc., into which this sensation abruptly broke; and so on, and so on. Indeed, extreme as the statement might seem, the total content of consciousness of any man, even when stung by a bee, is what it is, only as determined by the character of the stream of consciousness, by the entire psychic life, into which this particular content falls. (3) The criticism which Dr. Ward gives to the formulation of the law of relativity by Wundt, as well as the formula itself, need not concern us here. So far as either affects the principle of relativity, they have already been sufficiently considered in the discussion of Weber's law, of the nature of discriminating consciousness, of color and other contrast, etc.

"It is impossible," says a modern writer on psychology, "to resolve consciousness into a series of simple and self-existent sensations, absolutely independent of one another."[1] The same author applies a similar "law of relativity" to the feelings and to the will. We intend so to extend and to state the principle as to cover every factor and state of consciousness; but to do this, without denying a real and positive content to consciousness, and without affirming that the "mutual relations of impressions are everything." On the one hand, it is not true that "we cannot have a presentation X, but only the presentation of the difference between Y and Z;" but, on the other hand, it is true that every presentation X, or Y, or Z, is just such rather than X', or Y', or Z', in dependence upon the relations it sustains to the whole alphabet of the mental experience.

§ 14. Properly understood, the principle of the relativity of psychical

[1] Höffding: Outlines of Psychology, p. 114.

phenomena admits of almost unlimited illustration. We have seen that the principle applies to the quantities and qualities of all manner of sensations, to the sensation-complexes resulting from their mixture, and to the perceptions which arise in the development of intellect under the influence of sensuous excitations. As respects quantity of sensations, although Weber's law cannot be proved to have the exactness and universality of application which has sometimes been claimed, yet the facts which it generalizes all show that the question, "how much" any sensation is, in the estimate of consciousness, depends upon the relation in which it stands to previous sensation-experience—especially, of course, to that most immediately antecedent. It is true, as Dr. Ward has said, that "a letter-sorter who identifies an ounce or two ounces with remarkable exactness identifies each for itself and not the first as half the second." But it is also true that this identification *is* itself a complex psychical act of sensation and intellection which, as respects every factor of it as well as considered in its entirety, falls under the principle of relativity. Change the relation in which this experience of sensuous *quanta* and *qualia* stands to previous experience—for example, by fatigue of the arm, or distraction of the attention, or requiring just previous the lifting of heavy weights, etc.—and the total experience itself becomes different.

We have also seen that the very nature of all our more complex feelings and deeds of will is such as to indicate the importance of the relations they sustain to sensation, to imagination, and to thinking, as the accompaniment and habitual sequents of the same. But we should scarcely do otherwise than repeat the whole story of the analysis, already made, of the elements and of the progressively complex developments of mental life, if we endeavored fully to illustrate the principle of relativity. The word "faculty," indeed, represents an abstraction; but the facts of mental life and mental development which justify the abstraction are themselves all explicable only as standing in relation to each other. Each psychic reality—the actual state of consciousness—has its characteristics defined only while it exists as a complex of related factors, and as being itself a "moment" related to the onflowing stream of consciousness. [To use rather high and dry metaphysical language (and this, on account of its impressiveness):—What the individual phenomenon of consciousness is "in itself" can be understood scientifically only as this "in-itself-being" is seen to be related to all the "other-being" of the same so-called Self.]

By the Principle of Solidarity we intend to emphasize all that is accomplished in mental development, under the foregoing two principles, by the working of habit, in the widest possible meaning of this latter word. The mental life in its development is a whole in which the continuity and relation of all the different factors, aspects, states, and stages, must be recognized. But more than this—to speak with no unmeaning figure of speech—*the effect of every partial or complete working of the psychic mechanism is felt upon the weal or the woe of the whole development; and this development necessarily tends toward some kind of unifi-*

cation of result. To say this is scarcely more t
tion to the truth that in psychology we are d
logical" phenomena; the being, called Mind,
the subject of our study, is a *life.* Further
known forms of life incomparably the most c
full, at first, of undefined possibilities.

In the study of mental development we rec
plasticity, both organic and also strictly psychi
nings; but we recognize also that the lines alo
velopment proceeds become, although perhaps
even than the early promise warranted us in ex
stantly more legibly and rigidly drawn. For t
seems to apply to the development of every me
the influence of what we call habit is felt in e
We have thus to recognize habits of sensatic
feeling, and as well, habits of reproductive im
habits of conscious discrimination; while the al
ment of attention, with its constant focusing an
of psychic energy, falls under the law of habit.
all the complex developed faculties of percepti
thought, emotion, and desire, are understood t
same law. While the very seats of passive and
habit are thought to be in the association of ide
of will resulting in conduct, of the real origi
this universal dominion of habit we can—to sp
give little or no account; or rather, all our atte
ing for it is, at last, only a restatement of the fac
whether we vaguely talk of mental tendencies a
subconscious qualifications of an entity called mi
vaguely talk of tendencies, and strains, and pote
ing to the substance (the protoplasm, or "psych
of the brain.

The principal classes of facts which state, wit
for, the law of habit are the following: (1) Eve
cho-physical or more purely psychical activity—
and fundamental as well as the more complex a
oped—having once occurred is more likely to oc
degree of likelihood of the recurrence of any pa
can be only doubtfully measured according to t
its repetition, its relation to other habitual for
fitness in the system of the prevalent "dispos
(2) Habitual forms of activity—that is, those ac
with frequency—are regularly (but not always) c
by a lack of painful feelings of difficulty or by p

of ease. They emerge in the stream of consciousness without agitating its current. Some habits, however, like the habitual indulgence of certain emotions and passions, are of their very nature frequently recurring agitations of this current. (b) Diminishing of conscious attention, and of the hesitation and dubitation, which such attention often occasions, characterizes in general our habitual forms of mental activity. But here we may also speak, with equal correctness, of the habit of conscious attention, habit of hesitation, habit of giving one's self the pause before decision or action. (c) Prompt and accurate movement in general belongs to all those forms of habitual activity which allow of expression in movement. This promptness is connected with the lapsing of the necessity to think how to act, or even to call up in consciousness any mental image of the movement as it is to be accomplished. (d) In cases where the degree of almost or quite complete unconsciousness does not characterize the preparation and execution of an habitual act, the psychical series which leads up to and issues in the act is ordinarily much condensed.

(3) An important feature of all habits is determined by the relation in which they stand to that side of consciousness which we have called the Will, as developed, self-determining conation. A look at this feature seems to justify again the division of our habits into two classes—namely, the habits *we have* (as adopted, so to speak, by act of will) and the habits which *have us* (subjected to themselves, as it were). Yet this division is by no means fixed and absolute, as we have already had abundant occasion to remark.

Finally, the bearing of this universal law of habit on the solidarity of mental development is now obvious. Habit is in itself a partial reduction to order of the group of phenomena within which it "holds," or "reigns," as we expressively say. But, further, as certain individual psycho-physical and practical activities cannot take place simultaneously, on account of their opposed character or on account of the limitations of consciousness, so is it with habits of activity. Interferences of habit must be settled by domination of the stronger, by "survival of the fittest;" or the decision between the contestants must be made by conscious deeds of will, persistently put forth for an end, and one habit thus enforced and furthered to the diminishing of the other; or perhaps a new habit persistently formed. Thus in the development of mental life a sort of hierarchy of habits is necessarily formed. Whether those voluntarily adopted in view of some æsthetical or ethical ideal, and enforced by sentiment, or those

more passively experienced as arising out of the senses and emotions, regularly prevail; in any event, *a sort of unity of mental life must result from the working of this principle.* Here, as everywhere in the realm of vital phenomena, more than a certain amount of confusion and uncertainty is intolerable. The principle of solidarity must prevail.

§ 15. The biological and organic basis of habit has already been illustrated in treating of the cerebral conditions of the reproductive imagination (p. 241 f.). Everything about the infant indicates a mobile, flexible, changeable condition of the bodily organs; and an especially massive development of the cerebral nervous system with plastic and mouldable tissue in great abundance as compared with any uses to which such tissue has already been put. The metabolic activities of the infant are much more pronounced than are those of the adult. Its rapid heart-beat, frequent respiration, higher temperature, large relative size of the heart and organs of sense, are indications pointing in the same direction. At the other extreme, stands the much diminished metabolism, the hardened tissue with its loss of plasticity and acquired tendencies to function only in definite ways, which are characteristic of old age. That infancy and youth are formative periods, that habits of all sorts are then in the process of forming, but that new ways of living and acting cannot easily be assumed or reasonably expected in later life, and that every adult is a being of formed habits (even if it be the one habit of fickleness and incalculable conduct which is chiefly characteristic) —to say all this is to speak truth so trite that it scarcely wins attention. To illustrate this truth completely, and especially to enforce it as bearing on conduct and character, would carry us again over the entire areas already traversed.

§ 16. We shall therefore make no further attempt to enforce this universally admitted law of habit. It is enough to say that it is found prevalent everywhere; and that everything which is done by every human being, who has well entered on a course of development, illustrates the law. The way we walk and stand and sit and talk and write and eat and work and play; and as well the way we perceive, whether with or without careful attention, and the way we imagine and think and feel and desire—all come under the dominion of habit. Nor do we fail to illustrate this principle as truly when choosing, with much high thought and painstaking emotion, our profession in life or our religion, as when half-consciously winding our watch in mid-day because we are changing our clothing at an unaccustomed hour, or standing and wondering in the effort to unlock some door with the wrong key, because this one of our bunch of keys has been habitually connected with trains of thought such as we are now following.

The degrees of unconscious skill acquired, the amount of conscious attention still required, the duration and strength of the power, of the habit, the range of activities covered by it, the relation in which it stands to the complex activities of knowledge, feeling, and willing, vary indefinitely with different persons and different classes of habits. Thus we find the juggler Houdin testifying that after thirty years of cessation from practice, though he had "scarcely once touched the balls during that period, he could still

manage to read with ease while keeping three balls in the air at once."[1] On the other hand, we encounter frequent instances where some supreme choice, as in certain cases of moral reform or of religious conversion, seems to reverse with a single shock the habitual currents of thought, feeling, and will, as they have been flowing for many years. And yet even in the manner of this reversal, as has already been said, the general principle of habit vindicates itself.

It is with no view to provoke metaphysical or theological discussion that we call attention to the fact of the Teleological Import of all mental development. No *science* of the life of the mind is possible without recognizing the presence of final purpose in the collocation and arrangement which the phenomena come to have, as the stream of consciousness flows on. It may be that in saying this we are only enunciating what is the self-conscious and intellectual way of the developed mind for regarding its own development—the way *the Self*, as it were, *seems to itself*. The ultimate nature and ground of the seeming does not now concern us. What does concern us is that, wherever the phenomena of consciousness become objects of knowledge, and so the beginnings of a science of mental life are made possible, there these phenomena appear ordering themselves so as to attain practical ends. *Activity to some purpose is the ruling principle of mental development.* The self-conscious, intelligent, adoption of a plan, and selection of means for its pursuit, is distinctive of the *acme* of man's development. The more comprehensive this plan, and the wiser the selection of means, the higher is the standing of the individual in the scale of intellectual development. But ends suggested by æsthetical and ethical sentiment seem adapted to control large spheres of human activity; and the latter especially, from the very nature of the mandate with which it sanctions the end that promises its own satisfaction, has at least a sort of phenomenal supremacy. But meanwhile the principles of continuity, of relativity, and of conscious and unconscious habit, forbid that any consciously accepted end should be isolated, as it were, from the entire life both bodily and psychical. And when we regard the working of all of these principles, in every detail of mental development, we become aware that the import of final purpose in the mental life extends far beyond the conscious adoption of ends on our own part. In other words, the stream of consciousness appears not so much as a current flowing we know not whence nor whither; but rather as a current designed from the beginning, both as re-

[1] Autobiography as cited by Carpenter: Mental Physiology, p. 217 f.; and James: The Principles of Psychology, I., p. 117.

spects its observable surface and its hidden depths—partly self-directed and partly impelled by hidden forces—to the fit performance of a certain work. But what that work most fit is, if any such there be, scientific psychology does not investigate.

In fine, a combination of all these principles, as they appear in their actual operation, secures for every so-called stream of consciousness that continuity, related action, solidarity of character, and that intelligible import as judged by the light of ends and ideals, which are necessary to the history of what we call a Soul, or a Mind.

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